

MOTOR TREND

IND

MAY 1958
35c

"Have Car,
will travel"*



*TV's Paladin and custom Porsche

Why MT Selects Thunderbird as "Car of Year!"



**Make an Impala
Out of Your Chevy**

**How to Double
Your Car's Life**

**Comparative
Road Tests of
2 BUICKS**
reveal drawbacks
of air suspension

122 inches...
180 pounds...
170 horses!

see page 34

"I cleaned and waxed my car in 58 minutes



with Du Pont's NEW CAR WAX



...it's still gleaming-bright 6 months later"

says Charles J. Rockwell, of Paramus, N.J., after waxing his '56 Plymouth with Du Pont New Car Wax. "Rocky" found that this new paste wax is as easy to use as a liquid polish, because it cleans, waxes and glazes—all in *one easy application*. And it protects with real Carnauba wax, *the toughest wax known*. Proof of protection is the long-lasting gleam. Six months, 10 car washings later, the finish still shows clear reflections of "Rocky" and his wife! Try Du Pont New Car Wax—it makes any good finish look new. At service stations and auto supply stores. Only \$2.00.



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Test Turbo-Thrust Chevrolet scats up a punishing grade, two miles high in the Chilean Andes.



Even the Andes aren't high enough to make this V8 breathe hard! CHEVY TURBO-THRUST!

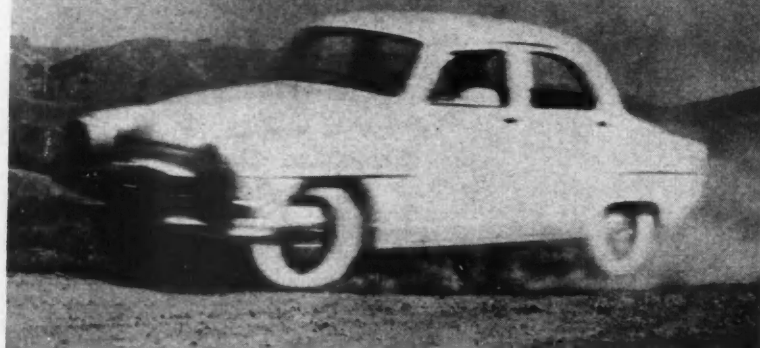
Tackle the toughest roller coaster of a road you can find—one that scrambles to a dizzy 12,572 feet—and even then you won't take the real measure of Chevy's new Turbo-Thrust V8! We proved that on the fantastic General San Martin Highway over the South American Andes, on gravel grades that ran up to 30 percent out of hairpin turns, in air so thin drivers gasped for oxygen. The tremendous torque of Turbo-Thrust's 348 cubic inches made every foot of the climb seem incredibly easy; its radical combustion-chamber-in-block metered out flawless performance from sea level to 2 miles in the sky! The Turbo-Thrust ran ocean to ocean and back in 41 hours 14 minutes—and the ignition key was never turned off, the hood was sealed shut! It's the greatest engine going in the low-price field today—and you can prove that right in your hometown traffic! Sample it and see for yourself! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

*Optional at extra cost.



Official Report #1

SIMCA, the Economy King, outperforms anything in its price class



The top experts of "Sports Cars Illustrated" magazine made the tests, and reported that SIMCA "will outperform anything in its price class." They also wrote: "SIMCA'S speed, space, acceleration, comfort, roadability and price are all carefully aimed at making it the most car for the money built anywhere in the world." And it's true! The great new SIMCA is a fabulous automobile buy. It's the car that got 42.6 MPG in authentic tests, and even pulled a 9 ton bus to show its deep-breathing power. And SIMCA is a Family Size car. You'll see that right away, when you drive the Economy King, the Paris-built SIMCA.



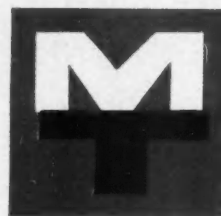
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4 MOTOR TREND/MAY 1958

MAY 1958



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NEXT MONTH

*Hanks Predicts Indy Winner
Comparing Two Mercs
Small Cars from Chrysler?*

MOTOR TREND

VOL. 10, NO. 5



THE COVER:

Richard Boone and his Devin-Porsche. Photo by Bob D'Olive. The engine is the one with which U.S. hopes to dethrone perennial European champions. Presiding at weigh-in is co-designer Orland Wilcox. Photo by O'Ce Ritch.

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the motorist

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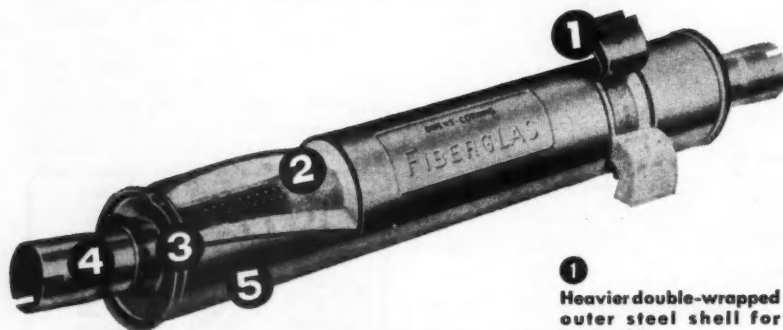
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from
the editor

IN CASE YOU'RE WONDERING about final new car sales standings for '57, here's the dope: Ford was first with 1,493,617 cars and 37,000 over Chevy, then came Plymouth, Buick, Olds, Pontiac, Mercury, Dodge, Cadillac and Chrysler, completing the top 10. Among the imports Volkswagen was first with 64,242 cars sold (which put them in 12th place overall, ahead of Studebaker, Lincoln, Imperial, Edsel, etc.). Next came Renault (just behind Edsel), English Ford, MG, and Metropolitan. Total sales of imports ran over 200,000, or 3.5 per cent of the total market—which is *twice* what they sold in '56. No wonder Ford, General Motors, and Chrysler are accelerating their "small car" programs. The way things are going, though, 1960 may be too late to catch the crest of the wave. On the other hand, maybe they have it timed like the fishermen with empty hooks who snag the tuna that are maddened to hunger by the all-too-few sardines tossed into their school. At the least, it'll be interesting; at the most, it could get cut-throat, with such measures as higher tariffs and "don't buy foreign" campaigns.

EACH YEAR, in the 34 states which do not have official motor vehicle inspections, voluntary Safety-Checks are conducted to call public attention to the need for maintaining their cars in safe driving condition. The sponsoring organizations—the Inter-Industry Highway Safety Committee and *Look* Magazine, with the cooperation of the National Association of State Safety Coordinators—have designated May as National Vehicle Safety-Check month.

If you are in a state that does not require a motor vehicle inspection, we urge you to take advantage of this free 10-point safety check of brakes, headlights, tail lights, steering, tires, exhaust system, glass, windshield wipers, rear view mirror, and horn.

"Can You See, Steer, Stop Safely? Check Your Car—Check Accidents."

Walt Rorer

PONTIAC SWEEPS NASCAR SAFETY HIGHWAY PASSING TESTS!

DAYTONA BEACH, FLA.

Pontiac again proves it is AMERICA'S NUMBER ① ROAD CAR
in the year's toughest test of SAFETY, HANDLING and PERFORMANCE!

HOUSEWIFE VICKI WOOD AND HER '58 PONTIAC taught men drivers a lesson in winning the 50 m.p.h. safe passing event. The elated Mrs. Wood reported, "... our new Pontiac handled and performed like a dream ... so smooth and easy I couldn't believe it".

Winner of the 30 m.p.h. passing event and high over-all winner of the safety tests with his standard 4-door Pontiac Catalina, magazine auto expert Jim McMichael cracked, "I could have told them before the tests—this '58 Pontiac is in a class by itself".



Pontiac dealers can promise prospects the industry's most exciting performance—and Pontiac will deliver it like nothing else on wheels!

Pontiac dealers have behind them the industry's hottest engineering team—which has created a car so advanced in basic design that it brings with it a totally new kind of driving.

And the word is getting around! Owners tell friends that Pontiac's Tempest 395 V-8 is unsurpassed for instant precise response. That its revolutionary new suspension system gives them a new feeling of command and remarkable freedom from pitch, sway and bounce.

In short, Pontiac dealers have America's Number 1 Road Car—and America's Number 1 Buy . . . from the low-price field to the ultimate in luxury!



NASCAR President Bill France congratulates winners. Events were sponsored by Pure Oil Company and the Florida State Highway Patrol.

PONTIAC MOTOR DIVISION • GENERAL MOTORS CORPORATION

MOTOR TREND/MAY 1958 7

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GUTS!
IN YOUR
TIRES!
WITH
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No Guts!

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No Guts!

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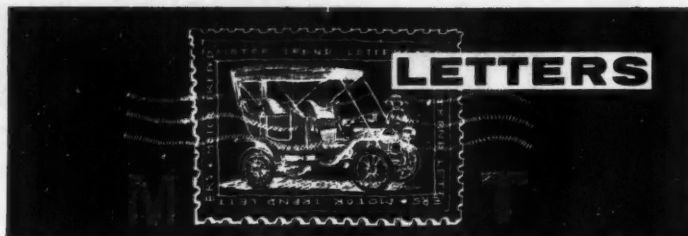
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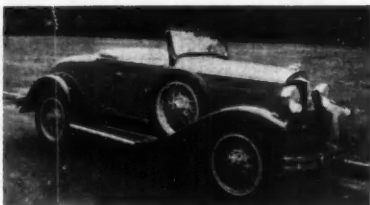
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PROUD PLYMOUTH

Gentlemen:

No doubt the forming of the Plymouth Four Cylinder Owners Club will be of interest to you. Its main purpose is the restoration and preservation of the 1928-'32 Plymouth; also the development and interchange of technical, historical and other information for and among members who own and are interested in the four-cylinder Plymouth.



Here is a picture of my fully restored 1929 four-cylinder, 45-hp, Model U Plymouth roadster. Three and one-half years went into its restoration. The car has won in competition over Cords, Lincoln Continentals and Rolls-Royces, among others.

Jay M. Fisher

Orange, N. J.

WRONG IMPRESSION

Dear Sir:

Walt Woron's article on English motoring in your February '58 issue was much appreciated, but it gives the impression that a sales tax is payable on used cars. This is not so, and Mr. Woron has probably been misled by the English usage of the word "taxed," when "licensed" is meant.

Also, I feel that \$245 at the present rate of exchange is a little steep for a 1936 jalopy, unless it's a perfectly preserved specimen.

Prices are high, but not that high. My 1935 Wolseley sedan, in good running order, cost less than \$100, ready to drive, and I've had 4000 miles of service out of her, with only a replacement fuel pump on the debit side.

Michael C. Sedgwick

London

CALLING ALL RODS AND CUSTOMS

Dear Sir:

The Midwestern Timing Association is planning its second annual Rod and Custom Show, to be held in the Memorial Coliseum, Fort Wayne, Ind., May 14-18. This year's show, which will include 20 classes, will feature some of the finest rods and customs to be seen.

Entry blanks are available at \$10 each, of which \$8 will be refunded if the car remains for the duration of the show. There will be a large variety of awards, such as trophies, merchandise, war bonds, two engines and many other prizes. Anyone wishing further information please contact me. Gerald L. Gerber, Pres., 2115 Otsego Dr. Rod and Custom Assoc. Fort Wayne, Ind.

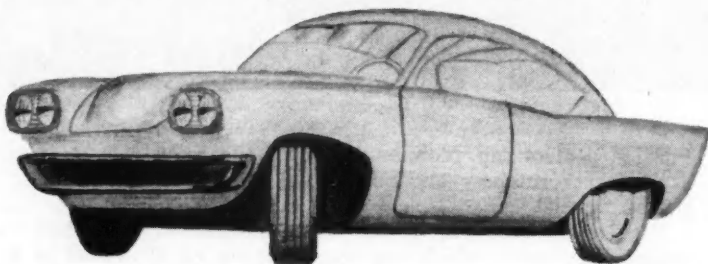
NO ROOM?

Gentlemen:

In "Sam Hanks Tests Four Corvettes" in your March '58 issue we believe there is a slight error. You stated that the Corvette with 290 bhp does 0-60 in 6.9, 95 in the quarter, and 114.9 in the half—but with a top of only 118.7.

Are you sure this isn't an error—or didn't the test driver have enough room to take the car out all the way?

Fred, Terry, and Duane Crown Point, Ind.
Top speed at Riverside was only 118.7 mph after a one-mile run. This particular Corvette is capable of a higher speed over a longer run.—Ed.



PLENTY OF TIME FOR THOUGHT

Gentlemen:

While waiting for further progress reports on your Kaiser all-purpose car, I decided to send you some of my ideas for your Traveler.

Generally dechromed, its sports car look is furthered by larger wheel cut-outs and less overhang. Lost space in the shortened trunk could be regained by dual fender fuel tanks which would allow it to be deeper. Up front, the Mercury-type bumpers avoid the bulky look by incorporating thin bars, but still give plenty of protection.

For the powerplant I would install a Corvette V8 with the new four-speed close-ratio gearbox now available from Chevy, providing it has sufficient torque for the heavier car. If so, its lower horsepower than the DeSoto you're using would be made up by its lighter weight, which would also allow better handling. Adjustable shocks, anti-sway bar, air lift bags, bigger brakes with finned drums, Traction Master and a beefed-up frame would be desirable chassis improvements.

Gordon Heller

Dayton, Ohio



The Studebaker
Golden Hawk



The Packard Hawk

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Yes, it's true. Because the Studebaker Golden Hawk and the Packard Hawk are the *only* supercharged production cars made in the U. S. A. The variable speed centrifugal blower provides up to 5 pounds added air at the carburetor inlet, with amount of supercharging proportional to engine rpm. The resulting high performance of these Hawks is matched to self-centering, self-energizing brakes carrying finned drums. Front suspension utilizes a new link-type stabilizer bar and variable rate coil springs for good handling characteristics.

At the rear, hydraulic shocks, angled outward, and asymmetrically mounted semi-elliptics help impart stability while cornering and minimize "squat" under hard acceleration. Instrumentation is complete, even to tachometer and manifold pressure gauge and positioned to be read at a glance.

The Golden Hawk and the Packard Hawk are always fun to drive, particularly so for knowledgeable drivers. And best of all, your family can join in the fun. Try it and see . . . at your Studebaker-Packard dealer's.



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- Install in 5 minutes—no cutting!

Many MV2 owners now get double original reception! Six tubes sound like 10! IF YOU drive far from "home" stations—like music anywhere, anytime—have mountains or few stations—are annoyed by limited selection, fading, tired reception—see your parts, accessory, gas or car dealer NOW! If not in stock, send his name and \$4.95 check or money order: we'll pay postage. **FREE LITERATURE!**

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Suite 173



**THE Rumor
MILL**

"Chrysler will produce a small car."

VERY POSSIBLE—They are getting closer to it all the time, though the recent trade they negotiated with Willys in which they traded '53 and '54 Plymouth dies for Willys Aero dies has nothing to do with it. This trade was effected to allow Willys to produce the earlier Plymouths in Argentina and actually benefits Willys more than it does Chrysler. When Chrysler produces a small car, it will probably be smaller than the 108-inch Willys.

"A number of Studebakers are at the Daimler-Benz factory in Germany on extensive tests with fuel injection."

FALSE—According to our informants, there is not even one Studebaker or Packard at D-B equipped with fuel injection.

"Marketing of a domestic-built small sedan by both GMC and FoMoCo is imminent."

FALSE—A tooling period of about 18 months seems to belie this; however, both companies have well-jelled designs and could tool up in time for the 1960 model year. September, 1959 seems to be about the earliest possible date.

"Engine displacement will again increase in 1959."

TRUE—There is at least one engine that will exceed 500 cubic inches.

"Chrysler products in 1960 will feature unitized construction across the board."

VERY UNLIKELY—This looked very

plausible until a short time ago, but the sales of '58 models appear to be dictating caution and economies. Unitized structures require virtually new production lines, methods, etc., so a better bet is for radically new styling and moderate engineering advancements for all five of the Forward Look cars in 1960. Things could still change though, if sales leap upward.

"In 1959 all General Motors' cars will share the same body shell."

TRUE—Even more, from Chevrolet through the Cadillac Series 62, the floorpans will be alike or nearly so. Cadillac's Eldorado models and the Series 75 will have distinctive shells and floorpans.

"Ford Motor Co. has appointed an Eastern importing firm to market the German Ford Taunus."

FALSE—FoMoCo has no need to go outside its own divisional setup for marketing of any of their overseas-built products. Truth is that about the time you read this the Mercury-Edsel-Lincoln Division will announce distributorship of the Taunus through its own franchised dealers.

"Poor sales to date make major styling changes impossible for 1959."

FALSE—Styling changes for 1959 were locked up long ago; there has been no retreat on the part of the Big Three, and the '59 cars will definitely show more exterior changes than they did this year. At least eight makes will feature virtually all-new outside sheet metal.

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NEW BRAKEMASTER HYDRO-EQUALIZER STOPS BIG CARS IN SPORTS CAR DISTANCES!!

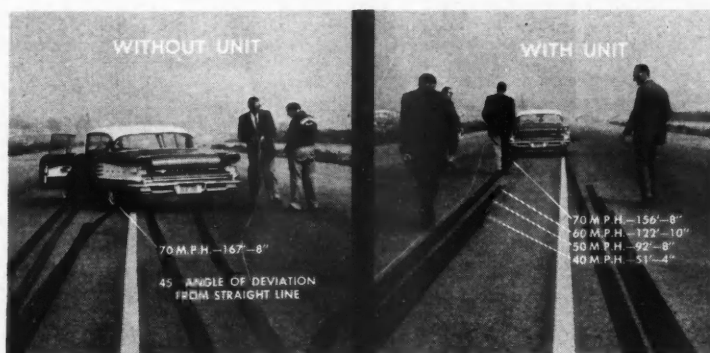


Hydraulic Fluid "Balancer" Unit attaches to any Master Cylinder giving up to 40% more Braking Power and Control. Ends Skid and Fishtail in Panic Stops! Works equally well on Conventional or Power Brakes.

Now, for the first time, BRAKEMASTER HYDRO-EQUALIZER, a new invention, gives the driver the vital stopping power he needs. Now, when the BRAKEMASTER HYDRO-EQUALIZER unit is installed to your master cylinder, your brakes work *with* the hydraulic fluid instead of against it.

BRAKEMASTER HYDRO-EQUALIZER stops you right now! When you stomp down on the brake pedal, with a standard master cylinder or power brake, high spots and "out of round" brake drums cause fishtailing, skidding and locking because the brake shoe is rigid against the drum. BRAKEMASTER'S *equalizing function corrects this!*

A BRAKEMASTER HYDRO-EQUALIZER in the hydraulic line allows the fluid to move, overcoming rigidity of the brake shoe locking against the high spots of the drum. You get up to 40% more braking power and control at all times.

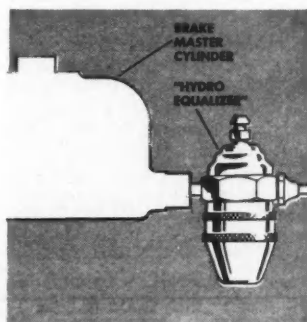


Tire marks from car having only standard equipment. Note the swerve that occurred and the longer stopping distance needed.

Tire marks from car equipped with BRAKEMASTER HYDRO-EQUALIZER. Note the arrow-straight stopping distance of 156'8" at 70 mph with this 1958 four-door Pontiac.

- Eliminate front wheel locking
- Retain complete control through the entire braking cycle
- Get up to 40% more efficiency, especially at speeds over 45 mph
- Obtain equal pressure at all four wheels instantly
- Saves tires, linings and bands
- Stop in 51' 4" at 40 mph.
Stop in 122' 10" at 60 mph.
Stop in 156' 8" at 70 mph.

GET THIS ROAD TESTED, ROAD PROVED SCIENTIFICALLY DESIGNED BRAKE-MASTER HYDRO-EQUALIZER FOR YOUR CAR TODAY. FITS ANY MASTER CYLINDER. INSTALL IT YOURSELF AND IMPROVE YOUR CAR'S BRAKING AND CONTROL UP TO 40%!



BRAKEMASTER HYDRO-EQUALIZER installs quickly and easily to your master cylinder using ordinary hand tools.

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NAME.....
ADDRESS.....
CITY..... ZONE..... STATE.....
MY CAR IS A YEAR..... MODEL.....
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SPOTLIGHT ON

DETROIT

by Joe H. Wherry Detroit Editor

STATION WAGONS OF THE FUTURE will, according to D. C. Woods of FoMoCo's Exterior Styling Studio, be quite different from those of today. "Perhaps, since the station wagon market now is over half a million units, someone will divorce the wagon completely from its regular car line and bring out a model strictly designed for large carrying capacity, good appearance, dependability, and ruggedness."

PREDICTIONS AS TO THE FUTURE course of station wagon styling include small, rear-engined types similar to some

European models (VW Combi for instance), allowing maximum passengers to ride inside of minimum exterior dimensions; a version based on a pickup truck but with removable canvas tops; a six-passenger vehicle with extended pickup-type bed (as International's new Travelette), a Club Car approach (where the driver is alone and back of him is a semi-circular lounge seat which could hold six or seven people). Another thought propounded is a system of "fully swiveling seats where the passengers could face to the rear, to the front, or in any direction, so as to vary their view on a long cross-country trip."

EXTERIOR APPEARANCE of future wagons

will include sliding or rolling top roofs, panels that retract into the roof, sides that swing up for easy entrance and exit, and super wagons featuring tables, sleeping bunks, and all of the comforts of home. In short, this would seem to point the way toward combining the house-trailer into the car.

LIGHTWEIGHT METALS are rising in importance since a dramatic new breakthrough at Ford Motor Company's metallurgic department. Dr. Victor F. Zackay, Supervisor of metallurgics in Ford's Scientific Laboratory, told me how a new metal called "Ferral" eliminates the brittleness which formerly has compli-



WHEEL-LESS cars are supported on air jets. Dr. Andrew A. Kucher on right demonstrates a Ford working model.

"TOMORROW'S CAR MAY HAVE NO WHEELS!"

This is the astounding prediction of Carl Reynolds, a Detroit product designer, who further states, "In 20 years, people will be riding in the no-wheels car and safety will no longer depend on tire wear and road surface conditions."

Reynolds believes the car, propelled by ducted fans, would maintain an altitude of about two feet, but would have the ability to climb to altitudes of more than 100 feet. He even says the car could travel over calm waters and "it would not be impossible to drive to Europe." (!)

The car would be constructed of a durable magnesium or aluminum alloy which would allow a smaller, lightweight engine to be used. "It could drive sideways, making parking easier, and would use turbine engines in a

system with ducted fans to generate gas pressures properly directed for propelling, steering and braking the no-wheels car," Reynolds concluded.

Meanwhile, a wheel-less car in model form was announced by a team of Ford Motor Co. research engineers under Dr. Andrew A. Kucher. It is said that its powerplant could possibly be a gas turbine or free-piston engine, using jet exhaust tubes for forward propulsion. The engine would supply a layer of air to replace wheels.

The air units replacing the conventional wheels on this model are called levipads (from levitate—meaning "to cause to rise and float in air"). A circular light alloy pad set into the bottom of the body is perforated with a number of tiny holes through which air is forced. In the demonstration

model we saw the air, under 90 psi, exhaust with such force from the three multi-holed levipads that the vehicle is actually lifted off a smooth surface a few thousandths of an inch. Not a flying car, this air pressure merely "lubricates" or cushions the flat undersurfaces, allowing virtually frictionless forward motion.

We tried to force the model down onto the table, but could not overcome the air cushion. Power was supplied from an exterior air pump.

We also had the thrill of scooting effortlessly along the smooth floor of the Ford Research Center on a triangular-shaped sheet of metal equipped with levipads and handlebars for directional control. And who is supposed to have said, "There is nothing new under the sun"?

'58 T-Bird to have convertible model in Spring, a possible retractable hardtop.... Rambler now has self-adjusting brakes.... Paris firm announces new "air suspension" system, Detroit suspicious of its advantages.... Station wagon of future predicted to include rear-engine types, ones with "passenger lounges" and fully-swiveling seats.... Ford has new metal that may bring gas turbines even closer.... Tomorrow's car to really ride on jet streams of air—with no wheels!....

cated development of most light alloys. An alloy of 90 per cent iron and 10 per cent aluminum, Ferral has resistance to oxidation and carburizing never before achieved. Able to take the high temperatures associated with turbine ducting, nozzles and guide vanes, Ferral opens up the way to economic production of gas turbines and various thermal and nuclear applications that seemed beyond grasp just a few months ago.

"AIR SUSPENSION" without compressor or reservoirs is what a new development of F. Allinquant of Paris, France promises. The suspension units, one to each corner of the car, combine shock absorber and spring in a single unit. The spring at the top of the unit resembles in function, at least, a conventional air spring. Filled with nitrogen because of that gas's inert and moisture-free qualities, the spring part provides ride control and softness; the rear units are fitted with leveling valves. But, when the rear end sags beneath a load, an electrical heating element switches on and the gas expands in less than one minute and raises the rear end to level position. The bottom end of each unit is the shock absorber and functions as a controlling damper. There is no complicated plumbing, air reservoir tank, or compressor. Best of all, the entire system, if produced in quantity, would cost

almost as little as conventional four-wheel steel coil spring systems.

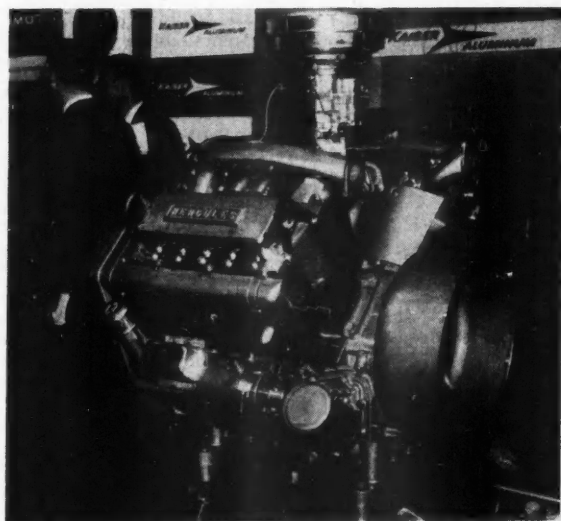
BIG THREE ENGINEERS and those of the smaller two have seen it; many like it, others evidently are suspicious of the Allinquant system because of its amazing simplicity. The ride this nitrogen over shock absorber oil gives is smooth, the cornering remarkably level, and there is no rear end squat. Nose-dive on panic stops is conspicuous by its absence. Overall handling and roadability is as much better, compared to current air suspension systems, as Chrysler's torsional system is over coil springs.

AN AIR-COOLED V4 ENGINE with interesting possibilities for the future is now in production. Originally designed by Lycoming, the entire engine with tooling has been purchased by Hercules Motors of Canton, Ohio, principally intended for industrial applications. Automotive engineers, though, saw numerous small car possibilities in the compact engine which measures about 26 inches long overall, 29 inches wide, and a shade over 29 inches high. Oversquare, with a displacement of 176 cubic inches, the V4 develops 70 bhp at only 3000 rpm and 140 pounds-feet of torque at 2200 rpm. Too heavy (463 pounds dry) and probably too high overall in its present state of develop-

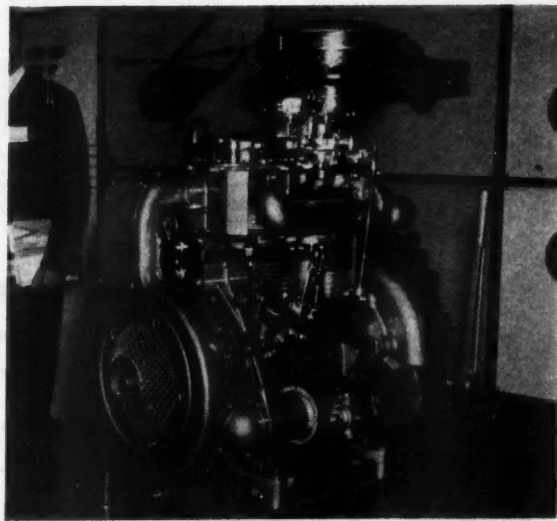
ment, this engine can be lightened 100 pounds or more by substituting a stamped sheet aluminum cooling fan cover and cast aluminum cylinder heads, intake and exhaust manifolds, and bell housing for the present steel parts. Lightweight aluminum pistons and a side-draft carburetor are reportedly under consideration. This could eventually make a very potent little engine with outstanding fuel economy and good performance. Raising the present 6.0 to 1 compression ratio a point or two would retain the present regular grade gas requirements. One specialty manufacturer is said already to be considering such modifications for small car use.

A TWO-CYLINDER AIR-COOLED engine by Hercules with 88 cubic inches and 34 bhp at 3000 rpm could also prove an interesting basis for a domestic minicar powerplant with modifications like those suggested above.

PREDICTION FOR 1959—The new Edsel will be evolutionary as compared to the current model. We are *not* merely taking the word of James Nance, general manager of the new Mercury-Edsel-Lincoln Division either. He has said the Edsel will continue its distinctive lines. But, we've seen the '59 car, it's a beauty, it will be distinctive, but it will *not* obsolete the '58 model. continued



AIR-COOLED V4 ENGINE by Lycoming has 176 cubic inches, 70 bhp at 3000 rpm, is only 26 inches long and 29 high.



TWO-CYLINDER AIR-COOLED engine by Hercules raises 34 bhp at 3000 rpm from its 88-cubic-inch displacement.

NEW

ignition analyzer kit

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of comparable analyzers



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- easy to build
- locates ignition trouble
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Here is a professional type ignition analyzer in "do-it-yourself" kit form to make your engine service and adjustment work easier. You can do a better job—and do it faster, with this new service tool. Quickly connects to engine to show complete wave cycle of ignition system and reveal troubles in plugs, coil, distributor, condenser, points, timing, etc. Comparable to units selling for more than twice the price. No electronic experience required for successful construction. Kit includes all parts, step-by-step instructions, and large pictorial diagrams. Send for details—or order your ignition analyzer now!

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SPOTLIGHT ON DETROIT

continued from previous page

ALL PONTIAC CARS will now come straight from the factory with all four wheels electronically balanced. This will mean that your new car will ride better, keep its tires longer, and have less tendency to develop rattles. So sensitive is the new balancing equipment that the weight of a single burnt match on a tire being balanced will change the adjustment needs.

SELF-ADJUSTING BRAKES for Ramblers have been announced for an optional additional cost of \$7.45. Available on all Rebel V8 and Ambassador models, the Bendix-made brake is like that used by Mercury and Edsel.

NEW ENGINE FOR CHECKER'S new car? First showing of the re-engineered and very venerable Continental Red Seal engine disclosed a bright beige and red-headed engine, still displacing 226 cubic inches but fitted with a new head incorporating overhead valves. Rated power has been upped to 143 bhp at 4400 rpm with the new valve train. This engine is the best candidate for power in the ever-elusive new family car that Checker is preparing to market (see page 40, Apr. MT). Incidentally, reports now put the initial output schedule at 12,000 cars to test the market.

THE '58 THUNDERBIRD four-passenger hardtop, unveiled by Ford dealers in mid-February, is to be joined by a convertible model employing a new principle in soft-top design and operation. Conventional convertible design calls for the top to fold into a "well" behind the rear seat. According to William Clay Ford, FoMoCo vice president in charge of product planning and styling, "the new design—introduced for the first time on the Thunderbird—lets the top fold into the trunk area. This way we don't clutter up the clean lines of the car and we get a full-width rear seat. After the retracting soft-top folds into the trunk, the trunk deck moves back into place, completely concealing the top." Ford uses a similar principle in its retractable hardtop convertible, where the all-steel top fully retracts into the trunk. "We're thinking about a retractable hardtop for the Thunderbird," Mr. Ford admitted, "but we're not doing anything definite at this time."

ALTERNATOR REPLACES GENERATOR in the electrical system in a new series of Ford truck engines. This looks to the future and we may logically expect such an installation in passenger cars within the next year or two. /MT

A 60-second
story that
will save you
'60
a year or more!

(more pictures and more text)

The experts were stumped



Service managers, carburetion specialists and factory experts realized the problems of higher fuel pressures, iron oxides in the gasoline and the increased fuel demands of higher horsepower engines, but . . .

Chances started
looking up!



... we hardly realized how serious the situation was until the trade started hearing actual experiences about Mileage Minder and performance tests were made by service managers and master mechanics . . .

The word spread like wildfire!



Now, reliable tests have proven that new Mileage Minder with magnetic Trouble Trap gives relief from gas waste, rough idling, dying, hard starting, flooding, traffic stalling, gas odors in the car, vapor lock . . .

No harmful pressure restriction



Mileage Minder tames hammering pulsations, smooths out flow of gasoline from fuel pump to carburetor at factory recommended pressures. Mileage Minder removes all foreign troublemakers, whether metallic, mineral or organic.

Guaranteed to make your car
happy—and save you money!



Big gas savings, smoother idling, reduced carburetor wear, tiptoe power and flashing getaway . . . freedom from fuel system service worries . . . without restricting factory recommended fuel pressures.

Here's How Mileage Minder with Magnetic Trouble Trap Absolutely Guarantees More Power, Performance and Mileage

Mileage Minder is the only patented, non-restrictive pulsation dampener, fuel purifier and carburetor protector. Only Mileage Minder employs the exclusive pressure chamber principle which stores fuel thrust and tames it into a steady, economical flow of gasoline to the carburetor.

Each new Mileage Minder is equipped with not one, but two fuel purifiers. A sintered bronze filter removes all dust, dirt and sand, even as fine as .003". In addition, the patented magnetic Trouble Trap, with its powerful XH-297 ceramic magnet, is positioned directly in the gas stream so that it captures and holds all troublesome iron and steel oxides, weld chips, rust flakes, thread shavings or any ferrous metallic particles.

News of Mileage Minder's success has traveled like wildfire. Mileage Minder has leapt to national prominence as car dealers and service shops the country over have found that Mileage Minder is the answer to fuel system performance problems.

NOW, try without risk! You'll save gas, start quicker, get away faster, eliminate galloping idle, vapor lock and stalling . . . or money refunded. At auto parts stores, car dealers and garages, or write us, enclosing \$7.95 and telling us the make, year and model of your car.

MILEAGE MINDER PROMISES AND DELIVERS ALL THIS:

- Big gas savings
- Smoother idling
- No galloping or creeping
- Ends vapor lock in fuel line
- Reduce carburetor wear
- Ends stop-sign stalling
- Tiptoe power-flashing getaway
- Quicker starting
- Smooth power all the way—no surge!
- Ends high speed fuel starvation
- Halts pressure-impact flooding
- Stops objectionable gas odors

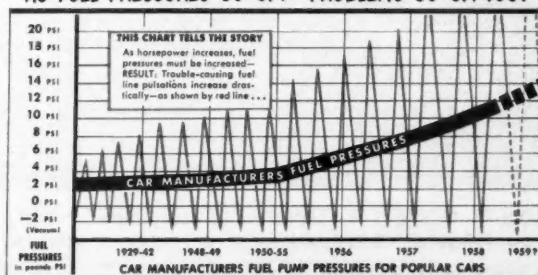


Brilliant chrome and di-chromate finish. Easily installed between fuel pump and carburetor without special tools. Patent Number 254280. Fully guaranteed. If bought separately, Mileage Minder and Trouble Trap—\$8.90 value. Purchased together, only \$7.95.

In chart:

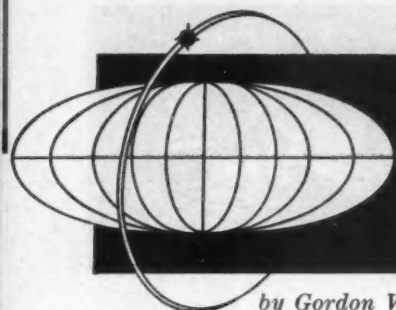
AS FUEL PRESSURES GO UP, PROBLEMS GO UP, TOO. Late model automotive fuel systems often reach thrust impacts of 30 lbs. Mileage Minder smooths out these impacts to an even steady flow, without restricting manufacturer's recommended fuel pressures. In addition, fuel in purified by bronze filter—plus magnetic Trouble Trap, with captures and holds all impurities that clog open carburetor needle-seat valves.

AS FUEL PRESSURES GO UP! PROBLEMS GO UP, TOO!



MILEAGE MINDER

Pacer Manufacturing Company, 533 Turk St., Dept. MT-5, San Francisco 2, California



WORLD

by Gordon Wilkins Overseas Correspondent

French announce "atomic" car....
Russians have new passenger car
 under test....Lotus building 3
 more Formula 1 single-seaters....
Fiat 1200 enters production....
Monza 500 slated for June 29....
Alfa Romeo developing new 1600cc

BRITAIN

Production of Jaguars broke all records in 1957 despite the fire that destroyed a quarter of the factory and a large number of cars. Two days after the fire, production was resumed, after 14 weeks it again reached normal level and now, with construction of additional shop, output is running twice as high as before the fire. Shipments to the U.S. increased by six per cent despite the fact that launching of the XK-150 was delayed for several months and production of the XK-SS has not been resumed since the fire.

Colin Chapman, 29-year-old designer-builder of Lotus Engineering, plans to double the capacity of his small factory.

Production has been interrupted on the Lotus VII—small low-priced sports car—to ensure delivery of the large racing cars ordered for the coming European and American seasons. Three new Lotus XIs have been sent to Florida to race at Sebring.

Chapman is also building the three Formula I single-seaters for drivers Keith Hall, Cliff Allison and Graham Hill; further developing the Lotus Elite Gran Turismo coupe in plastic; and is building prototype of the Lotus XV sports with the twin-camshaft Climax 1500cc engine.

Agreement has been reached between Colin Chapman and Michael Christie of Alexander Engineering to put the new grand touring Lotus Elite on the market. Plans are to sell the car on the Continent as well as in England, starting about the end of 1958.

In 1957 the British motor industry built 1,150,818 vehicles, representing an increase of more than 150,000 units over 1956. It was in exports that the greatest progress was made; 549,555 vehicles were exported.

United States was the most important market, having taken 94,867 against 38,205 in 1956. Australia was second with 49,056.

To the astonishment of everyone, a little Cooper-Climax Formula I car—not even "works-prepared"—was driven to a smashing victory by Stirling Moss over three new Ferrari V6s and six Maserati 6s. Another surprising fact is that no true Formula I Cooper has ever existed!

The Climax engine was increased from 1500cc to 1960cc by upping the bore and stroke. Even though it was under two liters, it was often referred to as a 2.2-liter engine for fear the race organizers would not consider it worthy competition for cars with engines of full 2.5-liter size. So the powerful Ferraris and Maseratis, with engines reputed to deliver up to 285 horsepower, were defeated by a little car built in a south London garage with an engine which at its very best could just touch 174 bhp!

The chassis is an extremely simple tubular space frame, with independent suspension at front and rear by a transverse leaf spring with a pair of wishbones. It has cast magnesium alloy wheels of ingenious design and light alloy brake drums with radial fins. The engine, mounted behind the driver, slopes downwards towards the front to lower the

center of gravity, and is canted over at an angle to bring the carburetors within the body shell. In the form in which it won the Argentine race, the car weighs about 870 pounds. Transmission is through a Citroën gearbox, mounted behind axle.



NEW JOMAR COUPE has stylized lines, performance of TVR sports model.

FRANCE

The 300,000th Dauphine Renault built since its introduction in March 1956 rolled off the line early in February. In the first year 100,000 were made; 200,000 figure was reached in October 1957. Production of this model is 1000 units a day.

Standard Motor Company's production facilities overseas were extended with the opening of a second factory in France. The new plant is situated at Beauvais, 60 miles north of Paris and is part of Standard's \$5.6 million expansion plan in France.

A reported agreement between Mercedes and Citroën to exchange distribution facilities in Europe has been denied by the latter. Citroën has acknowledged, however, that they are in contact with Mercedes and other manufacturers, but maintained that such an exchange had not been discussed. The parent Citroën company has some 5000 dealers throughout the world, 4000 of them in Europe and more than 100 in the U.S.

For transporting personnel in the Sahara Desert, Citroën has produced a four-wheel-drive version of the famous 2-CV. This was done by installing a second en-



VAUXHALL ESTATE CAR, based on Victor Super model, offers single-piece, lift-up tailgate, 45½ cubic feet of cargo space, four-foot floor width.

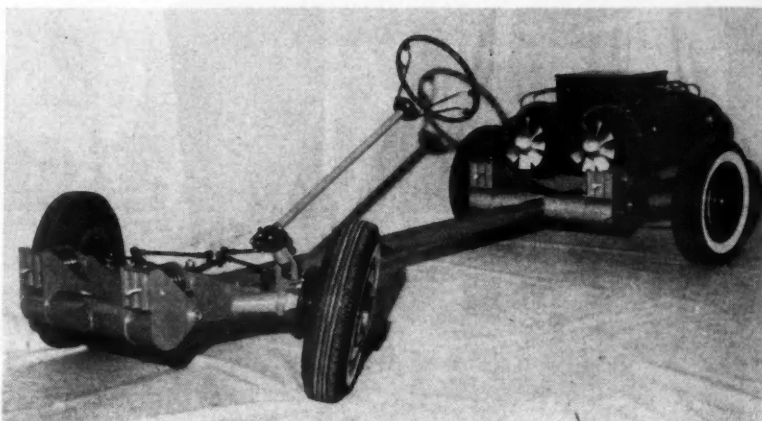
Porsche preparing new Carrera to meet Alfa threat....BMW building two new versions, one touring, one sport....Aston-Martin testing new Formula 1 race car....New Listers with Jag and Chevy engines slated for many wins....Alfa Romeo introducing new Giulietta Spyder convertible....Saab brings out Gran Turismo 750 with more power....DKW 660 slated for production soon....Vauxhall announces new wagon....Cooper-Climax Formula 1 car scores impressive win at Argentina....East Germany has new economy car....Farina only body builder to make future Ferrari GT-250s

gine and gearbox in the luggage trunk to drive the rear wheels. Even with this extra weight, the car weighs only 1408 pounds.

Rear end of the car is slightly modified to allow cool air to reach the engine, but otherwise the car is almost indistinguishable from the single-engine front-wheel-drive standard model. The two 26-cubic-inch flat twin engines each develop 14-15 bhp. Fuel consumption is said to be 21-26 mpg.

The transmission problem is simplified by having each engine drive through a centrifugal clutch. As one engine is switched off, no damage should result even if its gearbox is not immediately returned to neutral, as the wheels can turn the gears in the gearbox but cannot turn the engine.

The first atomic car project was revealed to the public at the Geneva Motor Show. Called the Symetric Arbel, it was built in a small workshop near Paris. It is electrically driven by a static generator using two superimposed bars of different metals, said to produce an electric current sufficient to drive the car when one end is heated and the other cooled. Theoretically heat will be obtained from radioactive material enclosed in a stainless steel box and surrounded by an electromagnetic field to prevent harmful radiation. The electric current drives the car via electric motors inside each of the wheels. The idea is that the generator would function continuously to provide the electro-



ATOMIC CAR prototype uses radioactive material to help produce electric current which in turn propels car through electric motors in each wheel.

magnetic protection even when the car is stationary.

The generator, at the rear of the tubular chassis, has two big cylindrical ducts, with cooling fans on each side of a square box. All wheels are independently sprung by rubber in compression. The saloon body has split sliding doors; the upper half disappears upwards into the roof and the lower half drops down into the floor.

The inventors admit the car has not yet been tested. It cannot run on French roads as the government has forbidden carrying radioactive materials in vehicles.

GERMANY

Production of the new Goggomobil

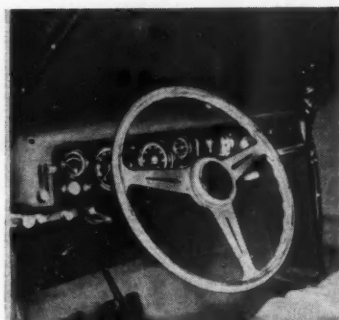
T-600 is planned to begin in May, starting with an initial daily output of 50 cars, to be increased to 200.

Auto-Union will start construction of its production plant for the new DKW 660cc car at Ingolstadt in spring. Before the end of the year there should be about 1500 demonstration cars of the 660 in dealers' hands.

ITALY

Ferrari has made an agreement with Pinin Farina under which, starting in September, only Farina will make the bodies for the Ferrari 250-GT. The de-

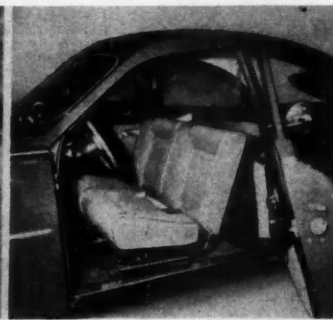
continued on page 52



SAAB GRAN TURISMO 750 has many interior refinements over 93 model (center, above). Instrument panel behind standard wood-trimmed racing steering wheel has



full range of equipment, including tachometer and Swedish Halda average-speed computer. Large bucket-type seats recline; optional headrest is available.



CAR OF THE YEAR!

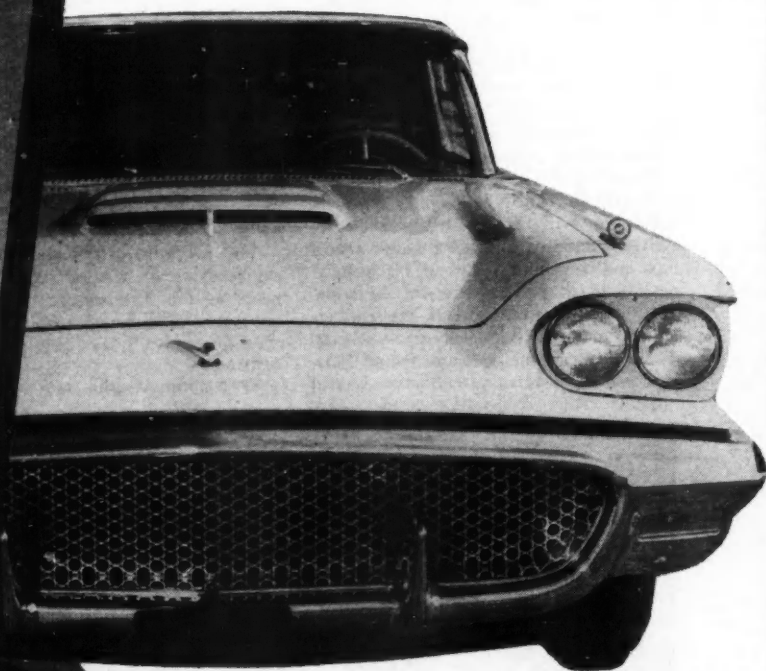
'58

1958 MOTOR TREND AWARD

Presented annually to the
U.S. Manufacturer making the
most significant engineering
advancement

TO FORD DIVISION

for
the overall concept of the
1958 THUNDERBIRD
a car that combines
safety with performance
and comfort with
compactness.



THUNDERBIRD

MOTOR TREND AWARD FOR 1958 GOES TO FORD FOR THEIR NEW CAR—A CAR THAT COMBINES SAFETY WITH PERFORMANCE AND COMFORT WITH COMPACTNESS

JUST FOR A FEW MOMENTS put yourself in the shoes of the editors of MOTOR TREND. Your immediate job is to select from among the 1958 cars the most significant advancement. Which one would you choose?

Would it be one of the cars with air suspension? Probably not, because there is much more development work to be done before these systems are even *as good* as our present steel spring systems.

Would it be to Buick for brakes? They have certainly made a good step forward in this department (see page 30). However, in 1957, when we spoke of the future years in which we would be presenting the MOTOR TREND Award, we stated, "We shall also disregard improvements that *should have been made* on previous models."

Would you consider one of the cars with fuel injection? Here is another engineering change that to us has yet to prove itself in everyday driving conditions. To date, it's not considered a distinct advantage over normal carburetion.

Would it be for an item such as the electrical door-lock system on the Imperial? This is certainly a desirable safety feature, particularly since it is under the driver's control.

Would you make the award to Chevrolet for being the one U.S. manufacturer who is continuing to develop and produce this country's only true sports car? We're glad to see it, but it truthfully is more of a rising to a challenge from overseas, than it is an actual advancement.

Would you bestow the award on American Motors for the introduction of the Rambler American, one of this country's two real economy cars? This in itself is a commendable

project, but the significance is that it has taken a few years to *return* to a basically-needed car; it's entirely possible that this has been brought on by the impact of the small imports.

There might be other developments you could have considered among the '58 cars, but staying within the intent of the MOTOR TREND Award, we're quite certain that the above items would have been the ones you would have considered. Yet, there's another that overshadows the rest because it so closely meets one of the requirements we set forth when we established the award.

When we presented the '57 Award to the Chrysler Corp. for superior handling and roadability characteristics of all their cars, we stated: "Our intent is to present this award each year, but with the proviso that some manufacturer must have made a noteworthy achievement on a standard production car—whether it is an entirely new approach to power propulsion, a great forward step in brakes, or a *totally new concept in interior packaging*."

Among the staff of MOTOR TREND there was unanimity on the choice of the 1958 Thunderbird as the car that best meets our stringent requirements. Certainly it meets the above italicized phrase. And more than that, it's a car that combines safety with performance, and comfort with compactness. Those are hard qualities to amalgamate.

Feeling that we should get the frank appraisal of a car expert who is no stranger to the readers of MOTOR TREND, we turned over our test Thunderbird to Sam Hanks. On the following pages you can read what he thinks of the 1958 Thunderbird. Then draw your own conclusions.



PERFORMANCE



by
**Sam
Hanks**

MAN, I'VE NEVER SEEN so much room inside a car for so little on the outside. (Sort of reminds you of a not-too-successful slogan used by another manufacturer a few years back, doesn't it?) If you think it doesn't have loads of room inside, don't take my word for it. Take a look at the chart here (page 23) that compares it to those other cars. Pretty amazing, isn't it?

They tell me the way they arrived at all this inside room is through the use of unit body construction. If that's the case, I don't know why they haven't used it on lots of cars before now. I know Hudsons and Nashes used it, and what was wrong with them? Besides which, it makes for a generally safer construction. The body absorbs lots of stress right along with what they call "stub frame rails." It should have fewer rattles too, because the body, floorpan and eight crossmembers are all spotwelded together as a unit, instead of the body being bolted onto frame members.

As long as present-day driving conditions are going to

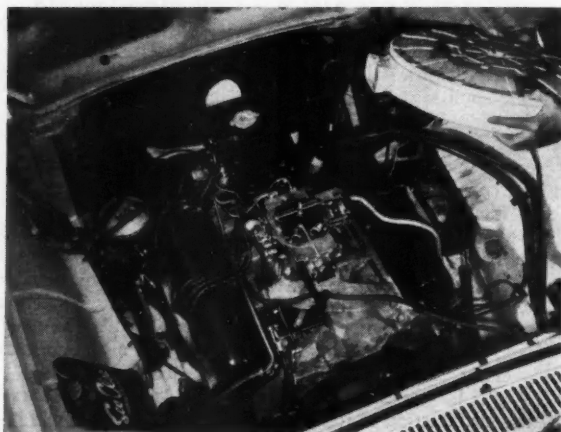
demand as much attention to driving as they do (it takes as much as I've ever had to at the Speedway!), I give my vote to separate front seats. I like maneuvering room for my arms and elbows. It's also one way to make that one-armed driver keep both hands on the wheel, both eyes on the road, and one mind on driving.

The seats are not what I'd call true "buckets," because they're not contoured like those in race cars or sports cars. But—the springs in the center part of the seat and seatback seem to let you sink in, and the kind-of bolster around the edges helps hold you in around fast turns. I know this is true for the driver and I didn't notice any of my passengers hanging on for dear life as I tried to untwist our favorite test road.

Personally, I'd like an adjustable column to get the wheel farther away. Right now it sits right in my lap. At first, the built-in armrest bothered my left elbow but I soon learned to avoid it. The side of the transmission tunnel is a wonderful place to rest the side of your foot and calf on long trips. Vision out over the hood and out the rear is very good; the rear window is so large and almost flat. I just wish there had been some way to shorten the width of that rear quarter panel. It's about 18 inches wide and unless you always take a second look when you change lanes, you might move over onto some little beetle that's hidden there.

Ford has really looked into this safety situation. They've

WITH AIR CLEANER removed, single quad carburetor is exposed. All engine components are easy to get to.



ACCELERATION

	300 bhp	375 bhp*
0-45	6.5	5.2
0-60	10.1	8.1
0-100	33.1	22.1
Quarter-mile	17.6 & 80.5 mph	—
30-50	5.1	3.1
45-60	4.6	3.7
50-80	11.4	8.6

*Horsepower is probable figure of prototype installation. Engine is identical appearance-wise to '58 Lincoln with 4-barrel carb. Both cars had Cruise-O-Matic transmissions and 2.9 to 1 rear axle.



RICHARD S. JOHNSON

been working on it for a long time now, and it's my feeling that they've pioneered a lot in the field of interior safety, particularly. It's lucky that they were able to coordinate the wants of the stylists with the needs of the safety engineers. Look what they've done:

Made the instruments as legible as they can. Used the dished wheel. Put a padded roll over the dash, which not only will tend to reduce head injuries to anyone in a crash, but also cuts down on those annoying instrument reflections onto these new curved windshields at night. Used padded visors and a swingaway rear view mirror. Reduced to an absolute minimum the number of knobs you could hurt your knees on. Used padding on the back of the front seats to soften the crash of a backseat passenger. (The only change I'd like to have seen here though would be a sliding-bolt arrangement to keep the front seatback from being folded flat by a rear seat passenger flying forward in case of a sudden crash stop.)

I'd say that the ride of the new Thunderbird is as comfortable as any American car today, regardless of size. They've



SAFETY



done a lot on sound insulation, too. The engine sounds mighty quiet except when you're really standing on it. Handling is comparable to all but the very best. I'm a bug on this, though, and what I'd like in the way of stiffer shocks and quicker steering might not be what the average owner of such a car would want.

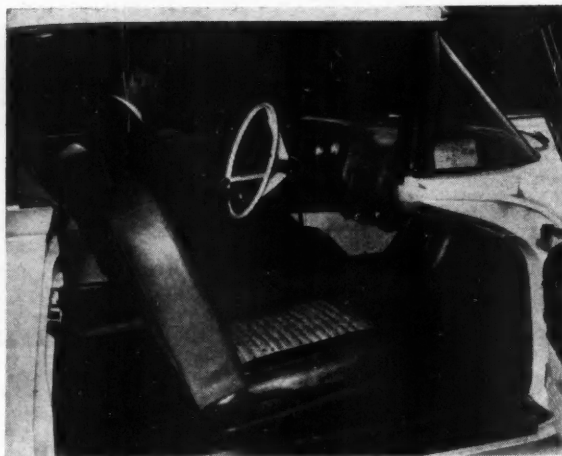
The performance of the '58 Thunderbird is about what you'd get from the hot Fairlane 500; in fact they both use the same engine. I hear lots of talk about them going to a bigger engine of 430 cubic inches for the T-Bird. Not that they need it! The present job has plenty, so they don't need 360, or the 400 horses I've been hearing about too. One good thing if they do change—it won't bother the good engine accessibility it now has. As one guy who looked under the hood said, "This is great for us guys with big feet!"

It's easy to get at the plugs, at the distributor sitting right on top, and even at the bell housing from inside the engine compartment. The front-hinged hood leans way forward and gives you room to move around without fear of cracking your head. One note on that airscoop: it was necessary to clear the huge air cleaner, and is one of the few I've seen that isn't a falsie.

So, would I agree with what MOTOR TREND had already decided? Sure! Like they say, it's got safety, performance, comfort, and compactness. And I hear from Detroit that the Ford people are producing the Thunderbird on a heavy overtime schedule to meet the demand. That's a pretty great send-off.

/MT

COMFORT



SEATS have comfortable "sink-in" feature, with necessary support contouring around body. Note wheel position.



ROLLED CUSHIONED DASH has nice contoured appearance and reduces body and head injuries in case of accident.

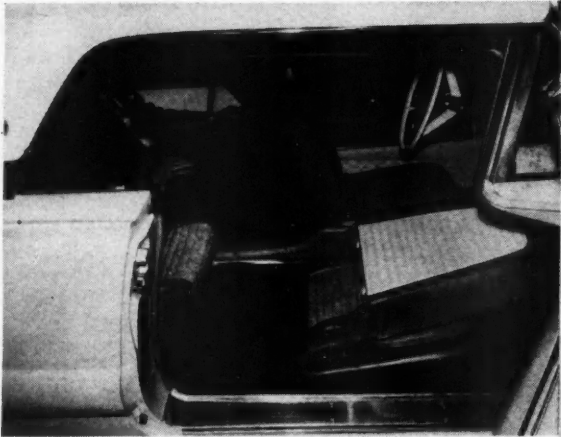


REAR SEAT ENTRY is tight for headroom, but the wide-opening door is far better than in most Detroit hardtops.

PHOTOS BY BOB D'OLIVO



CONTOURED BODY PANELS and completely different tail lights make Thunderbird distinctive. Legroom and headroom in the rear seat are outstanding—being comparable to even some of the large luxury cars of today.



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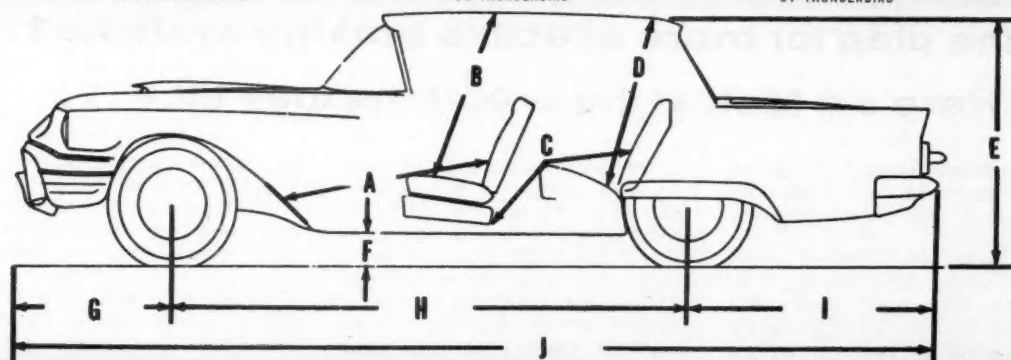
COMPACTNESS



'58 FORD FAIRLANE

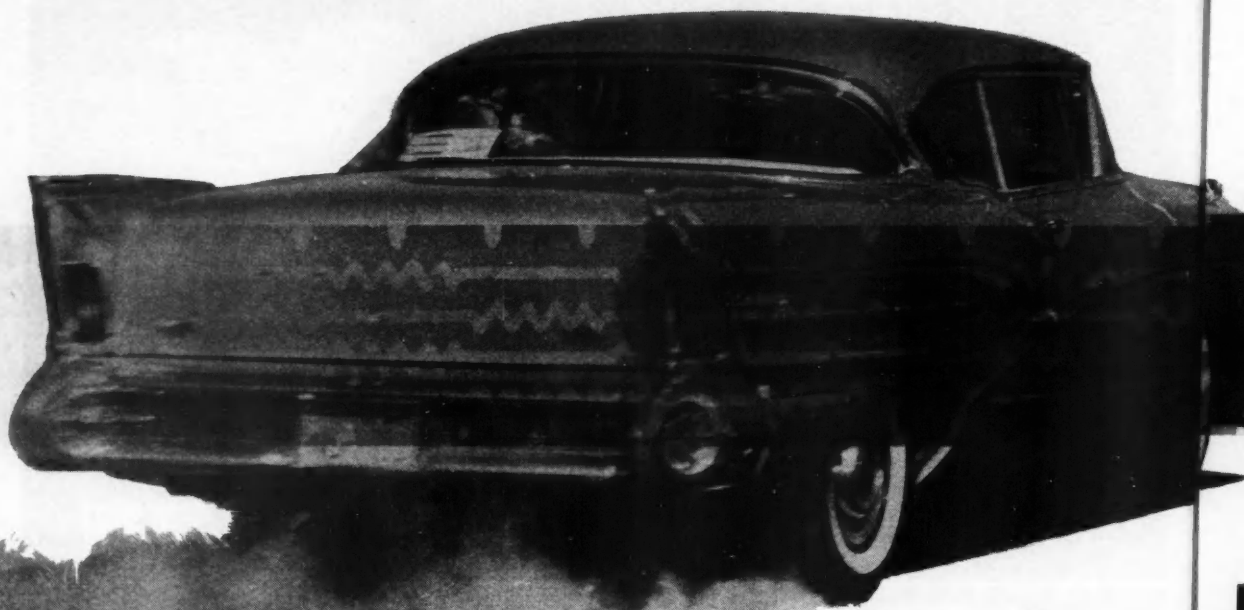
'58 THUNDERBIRD

'57 THUNDERBIRD



HERE'S HOW THE '58 THUNDERBIRD COMPARES IN SIZE

	'58 THUNDERBIRD	'57	'58 FAIRLANE	'58 CHRYSLER 300-D	'58 CADILLAC 62	'58 LINCOLN
A—Front Legroom	43.4	44.9	43.2	45.5	44.6	44.4
B—Front Headroom	34.5	33.1	33.8	34.4	34.2	35.0
C—Rear Legroom	38.8	—	40.8	38.0	41.0	46.6
D—Rear Headroom	33.3	—	33.6	33.7	34.0	33.8
E—Overall Height	52.5	51.6	56.2	57.3	57.7	56.5
F—Ground Clearance	5.8	7.1	6.0	5.6	6.4	6.1
G—Front Overhang	35.6	28.3	35.2	35.0	35.6	37.2
H—Wheelbase	113.0	102.0	118.0	126.0	129.5	131.0
I—Rear Overhang	56.8	51.1	54.0	59.2	56.7	60.6
J—Overall Length	205.4	182.0	207.2	220.2	221.8	229.0
Overall Width	77.0	72.8	78.0	79.6	80.0	80.1



"Give us a Brake

What are U.S. auto engineers doing to answer the plea for more effective braking systems?

Here's a look at the problems they face . . .

"OUR COMPANY'S BRAKES are as good as the rest of 'em, so why should we get all excited about radical, expensive new designs?"

This was the comment from a Detroit engineer recently asked why his company didn't push brake development more vigorously—in view of the increasing horsepower of their engines and coasting momentum of their cars using torque converter transmissions. We doubt if this attitude is really typical of the powers that be in the Motor City. American passenger car brakes are being steadily improved, and hundreds of thousands of dollars are being spent on the work. But there is no sense of urgency here. Evolution, not revolution is the watchword.

So the big question is this: Is the braking problem on our family cars urgent today? Does it call for radical measures *now*? Is gradual, evolutionary brake development adequate to keep pace with the performance and weight of our cars? If not, what should be done?

Let's look at a few fundamentals first. An automobile in motion possesses a cer-

tain amount of kinetic energy, or inertia. The actual amount of this energy—which can be expressed in foot-pounds, incidentally—depends only on the *velocity* of the car and its *weight*. Kinetic energy is directly proportional to weight, but increases as the *square* of speed. In simple terms this means that a 4000-pound car traveling 40 mph would possess twice as much kinetic energy as a 2000-pound car traveling 40 mph . . . but the energy of both cars would *double* if they speeded up to only 56 mph! Keep in mind always, then, that speed is a good deal more potent than weight in problems of auto dynamics.

When we slow a car down or stop it this kinetic energy *must be dissipated*—it's got to go somewhere. There are several possibilities. If you just let off on the throttle and coast, the energy will be gradually dissipated in wind resistance, tire rolling resistance, chassis and engine friction (*not* engine compression, like most everyone says). If you slow down by hitting a tree, your kinetic energy is put to work bending sheet metal and channel iron, shoving the engine into the

front seat, breaking glass, and maybe chopping down the tree.

This brings us to the brakes—which are nothing more than devices for *converting kinetic energy into heat*, by rubbing pieces of friction material against pieces of iron or steel. These, of course, permit you to control your rate of deceleration to some extent. A lot of heat is generated, too. Stopping a 4000-pound car from 70 mph theoretically develops enough heat to melt three pounds of iron—and, on a hard stop, this is generated in about 4½ seconds!

Theoretical slide-rule figures don't tell the whole story. In fact, strictly on a velocity-weight basis the current brake problem doesn't look too serious. Average highway cruising speeds, what with state speed limits, are probably not significantly higher than they were five or six years ago—and car weights aren't up more than five per cent. In other words, average kinetic energy figures are not 'way up as you might think by looking at horsepower ratings.

But there are secondary factors at work. One is the lack of engine drag

DETROIT!"

by Dean Parker

when you let off the throttle. A torque converter is not an efficient reversible "clutch," so engine rpm drops radically when you close the throttle and coast. This reduces the engine friction that would ordinarily act to drag down the car, though fluid couplings do transmit some torque backwards down to fairly low speeds. Possibly the greatest contributing factor to lessened engine braking are higher-speed rear axle ratios used with automatic transmissions. These reduce engine rpm (and friction) at any given road speed.

Contrast this situation with a car of 10 years ago—with its solid clutch, long-stroke high-friction engine, and 4.1 to 1 axle ratio. When you backed off one of these at 65 mph it was like throwing out an anchor. For the most part, you had to touch the brakes only in an emergency. The brakes on today's cars have to work considerably harder when slowing down from any given speed.

Furthermore, you have to slow down more often these days. The roads are more crowded. And here's an angle you may not have considered: Due to the greatly increased horsepower and torque of our late cars the tendency is to maintain a higher *average* speed in relation to *cruising* speed. You may not cruise any faster than you did five years ago, but your brakes will tell you you're slowing down from those higher speeds more

often because you can accelerate up there so quickly. Couple this with the effect of the crowded roads, and . . . well, let's face it: The overall average heat input *per minute* to the brakes on the average American passenger car must be at least *twice* what it was on the average 1950 model. Does this constitute an "urgent" brake problem or doesn't it??

HEAT GENERATED BY FRICTION between a brake lining and drum can do diabolical things. On a reasonably easy stop from a reasonable speed everything is okay, though rubbing-surface temperatures on the drum during high-speed panic stops have gone over 700° F, while stops at 100 mph have caused the temperature to rise to almost 900° F. As the brakes are used harder—in other words as the heat input, in BTU's per minute, is increased—things begin to happen. As lining bulk temperatures go over 400° or 500° the friction coefficient between lining and drum falls off rapidly. As the drum heats up it expands and distorts, so the brake pedal has to be shoved farther down to make contact. When contact is made it's not even all around the drum—which causes hot spots on the lining and further loss of braking. Really severe usage can even cause boiling of the brake fluid in the cylinders and lines, giving a spongy response to the pedal (or this can happen under more mild conditions with

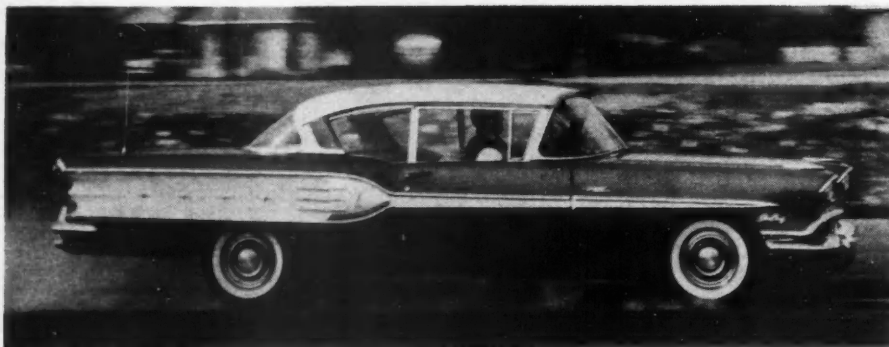
some of today's cheap brake fluids). The way the heat gets in the "foot" of the pedal is not just the pedal, clear to the floor and moving down hard on the brake pedal. It can be approached under certain conditions (very hard braking, very long coasting, etc.) in what could be called "pedal driving" on today's highways with today's cars. There is a point on the other side of the fence to consider, however. Some of our foremost engineers think that the onset of fading is a "must" warning to the driver, and that brakes designed to give *no* fade may result in an instantaneous failure.

Obviously there are two broad paths we can follow in fighting this brake heat problem: (1) We can design the brake so it can operate efficiently at much higher "equilibrium" temperatures—where heat dissipated is equal to heat input; and (2) we can concentrate on more efficient cooling of the brake. Or, of course, we can improve brakes with a combination of the two features. But, let's look at each category separately.

THE MOST IMPORTANT FACTOR in the heat capacity of a brake is the heat capacity of its friction lining. Since asbestos is essentially a fibrous mineral, it requires various organic binding materials to form it into a hard, solid lining strip. It's the latter that causes most of the trouble. Under high heat the resins tend to char (burn) and the oils get soft, causing what appears to be a sort of *lubricating* effect between lining and drum. If overheating is not too severe (causing the lining to literally burn up and fall to pieces), the friction will be largely restored when the linings cool down—which, however, can take as much as 20 or 30 minutes. Meanwhile the brake pedal gets very "soft," you

continued





"Give us a Brake!" continued

can smell the hot linings, and the car tends to pull to one side or the other.

This is a very tough problem to solve. You can use "hard" heavy-duty lining, as used on trucks—which can take more heat without appreciable loss of friction coefficient—but pedal pressures are much higher, the brakes tend to be noisy, there is some tendency to grab when cold, and they cost more. Soft linings give most of the things we want in a brake except heat resistance. They're cheap (and think of what you can save on a million cars a year at, say, 32¢ a car); the friction coefficient is high, so you can lock the wheels with as little as 50 pounds pedal pressure with vacuum boost; they're quiet and smooth in action in all kinds of weather; and they give pretty decent wear. This is one of the terrible compromises Detroit engineers have to make. They, along with a great majority of customers who prefer these features, choose the soft linings—and our brakes fade under hard use.

Perhaps the final answer to this one will be the *metallic* lining . . . that's right, a metallic "friction material" acting directly on an iron or steel drum. Science has been working with metallic friction materials for at least 15 years, and we now have several formulas that might be worked up into a practical passenger car lining.

The new Thunderbirds are using a short strip of sintered (fused powder) bronze-ceramic material as a reinforcement between short strips of conventional asbestos lining. Chevrolet uses the stuff as the sole lining medium for Corvette competition brakes and is using it on Chevrolet police cars in Milwaukee. Other interesting tests have been made with copper, powdered iron, and even aluminum combinations. Any metallic lining, of course, is practically immune to fade, right up to the melting point of the base material.

The big problems are similar to those encountered with extremely hard asbestos linings—multiplied a hundred times. These would be high pedal pressure (due to low friction coefficient), squeaks

and grabbing when cold, high cost, plus a problem of fast drum wear. Some of these problems look impossible right now but the fact remains that there is a lot of money being spent in Detroit on development of metallic lining.

A MORE OBSCURE FACTOR in this business of brake heat capacity concerns "self-energization." By pivoting a brake shoe in such a way that the friction drag of the drum tends to pull it harder against the drum, we can get a considerable increase in effective braking force for a given pressure on the pedal. This is called a self-energized, or "leading," shoe. It's a great gimmick for low pedal pressures. But think about it a minute. Since the shoe is depending a lot on lining friction for the force to press it against the drum, it follows that any *loss* of this lining friction due to heat fade will be *multiplied* in reducing braking force. Not only that, but the brakes will tend to be erratic—mushy, grabby, mushy—with a tendency to pull.

American cars are noted all over the world for ultra-high-servo brakes. Over three-fourths of our current production uses the clever Bendix "duo-servo" design, where the heel of the leading shoe is allowed to float freely sideways and push the heel of the secondary shoe against the drum—when braking pressure is applied at the other end by the hydraulic piston. This arrangement gives the highest self-energization of any known two-shoe brake design. Next in line is the two-leading-shoe design, employing two separate cylinder units—as used on Chrysler front brakes.

Anyway, it should be clear at this point that one way to get a brake that will operate more efficiently at high temperatures would be to *reduce* the self-energizing effect—so the brake wouldn't depend so much on lining friction for its applying force. A leading-trailing-shoe front brake, such as was quite popular on pre-war cars, would be a step in the right direction. And, of course, the ultimate along this line is the British Girling two-trailing-shoe layout, as used

on current Jaguar sedans and Daimlers.

Here a separate cylinder is used for each shoe, and the shoes are pivoted *against* drum rotation—so lining friction tends to disengage the brake. The linings will all but burn up before there is any appreciable fade or grabbing, though whether this lack of warning by fade is advantageous would again be argued by many chassis engineers. Big disadvantage, obviously, is that they require a lot of brute force to apply. Some kind of efficient power assist is a must . . . and if there is a failure in the assist mechanism it takes two men and a boy to stop the car. Detroit is awfully touchy about this aspect; they don't want any brake that won't work decently in event of power failure and we agree with them. A separate reserve power supply would probably be the only way this idea could be sold to Detroit (if costs could be licked) . . . but it's a cinch that two-trailing-shoe brakes could solve a large percentage of our brake fade problems.

WE FEAR THAT THE PROBLEM of efficiently getting rid of brake heat on our cars is going to prove more expensive than learning to swallow it! There are several possible paths open. The direct approach would be to feed a cooling medium right to the brake in sufficient quantities to keep temperatures within limits under the worst possible conditions. This could take the form of ductwork to ram air onto the brake, or, as in some designs, special fins on the drum or wheel to act as a turbine and draw cooling air across the drum. Or there's the new Raybestos experimental system where the brakes are cooled directly by water, and the heat is dissipated in a radiator. Both methods are very efficient—and very expensive. Neither looks practical for Detroit within the next few years.

Designing the brake drum to dissipate heat more efficiently is a possibility. Casting fins on an iron drum, like Studebaker-Packard, helps some. Buick's trick of casting a finned aluminum shroud around an iron liner (with holes in the liner to bring the aluminum down in contact with the lining to aid in cooling) is better yet . . . in fact, this is now undoubtedly the top American passenger car brake. But it's costly, and it remains to be seen if the others will follow.

It's not generally recognized that one way to get a cooler-running brake is to simply build a *bigger* brake. This not only gives more mass to absorb heat overloads on hard stops, but there's more area over which to dissipate heat. A good measure of relative brake size is the area of drum swept by the lining per ton of car weight. The more the better. A hairy sports-racing car like a Ferrari might have 300 or 400 square inches of swept area per ton. Our Detroit iron runs closer to 150 square inches per ton. Increasing

continued on page 54

GAS TURBINE PROGRESS REPORT



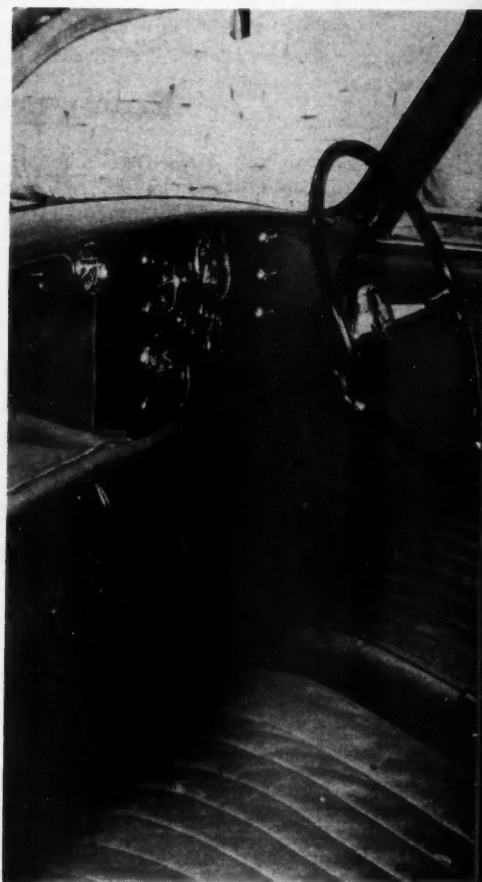
PHOTO BY GORDON WILKINS

First drawings and photos as Duke of Edinburgh drives latest version of Rover gas turbine car, which after eight years of development, appears to be finally approaching production feasibility

IT IS BECOMING increasingly obvious that the finally marketable version of a gas turbine car will be something more than a car which we now consider conventional and modified only by a powerplant swap.

The latest accomplishments of the Rover Co. at Solihull, Birmingham, England, are indicative of this trend. Back in March 1950, this company made their pioneering contribution to gas turbine propulsion in automobiles. Known as Jet 1, their first roadable GT car was a conventional open touring car, adapted to the new and unconventional powerplant. Eight years later, the fruit of research and development has ripened in the form of their T-3 which is specifically designed from the wheels up as a gas turbine car. This does not mean it is an exotic, "dream car" type, but rather a highly practical and roadable vehicle.

In its present state of development (and development is continuing constantly), the power unit in the T-3 has an output of 110 bhp at 52,000 rpm compressor speed. Although less powerful than its 200-bhp predecessor in the Jet 1, it is considerably more efficient, particularly



FOUR-DIAL DASH includes tachometer, exhaust temperature gauge. Forward and reverse selector is located over tunnel between bucket seats.

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photos and cutaways

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in regard to fuel consumption. It is a two-shaft design with the compressor and turbine rotors mounted on a common shaft and a power turbine rotor on a second shaft connected to the output gearing.

Briefly it works like this: Intake air is drawn into the compressor and forced into a heat exchanger where it is "superheated" by exhaust gases. After leaving the heat exchanger, the air is mixed with fuel in the combustion chamber and ignited. The hot, expanding gases are then directed against the turbine rotor which is on the same shaft as the compressor. The gases are then passed to the power turbine rotor on the output shaft after which they exhaust through the heat exchanger and serve to heat the incoming air.

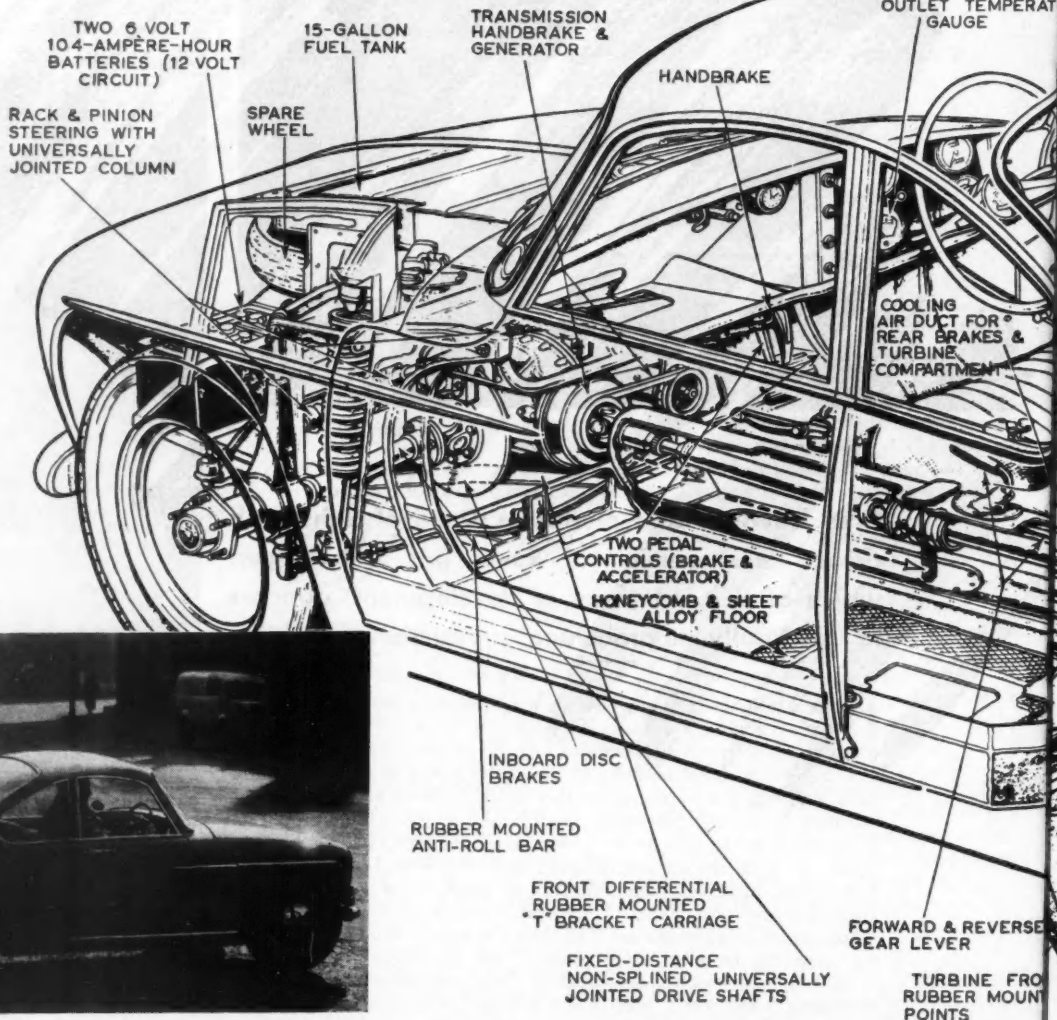
Apart from its powerplant, the T-3 is a unique automobile. The plastic coupe body incorporates light alloy honeycomb sandwich material in the floorpan and rear-engine compartment bulkhead. This material, used extensively in aircraft construction, has a high weight-to-stiffness ratio and excellent insulating properties. Its use in the bulkhead shows a good choice of material to confine heat and turbine whine to the engine compartment.

The car has four-wheel drive, considered by Rover engineers as a desirable feature in a turbine car because it reduces the possibility of loss of wheel traction and corollary skidding when the turbine develops full torque. This is always a possibility in turbine cars because the lag in throttle response makes it difficult to retain sensitive control over the accelerator pedal.

An overrunning clutch device keeps the power applied to the rear wheels only until they lose traction; then the drive becomes operative on all wheels. This system has been a feature of heavy U.S. Army trucks for several years. Another inherent characteristic of turbine-driven cars is their complete lack of engine braking. To compensate for this, the T-3 is equipped with four-wheel disc brakes.

Performance-wise, the car can exceed the capabilities of a car equipped with a piston engine of comparable horsepower. From a standing start, it has reached 60 mph in 10.5 seconds. Top speed has not been ascertained but indications are it will be considerably in excess of 100 mph. Fuel consumption, as a result of adding the heat exchanger to the powerplant, will run from 12 to 14.5 mpg on the road. /MT

Rover gas turbine continued



PHOTOS COURTESY
THE AUTOCAR



RAISED DECK houses turbine and heat exchanger.

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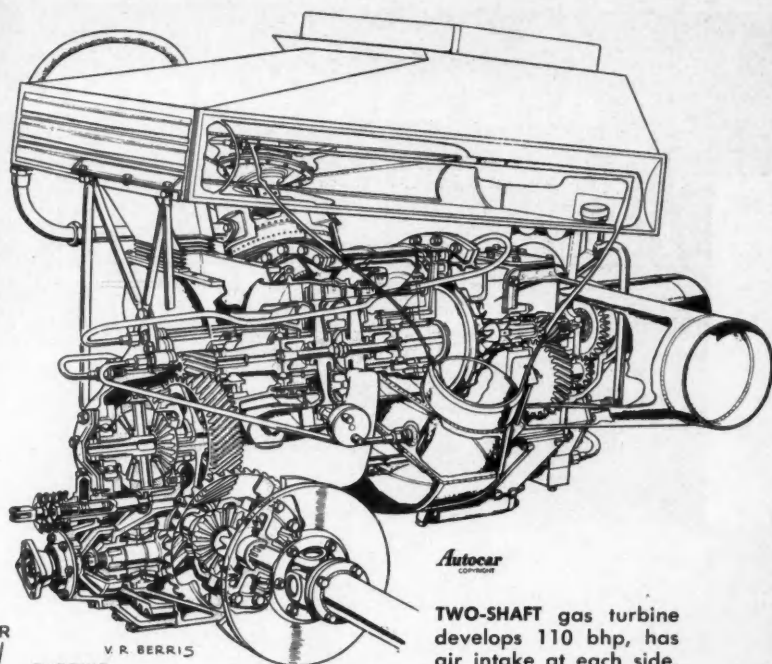
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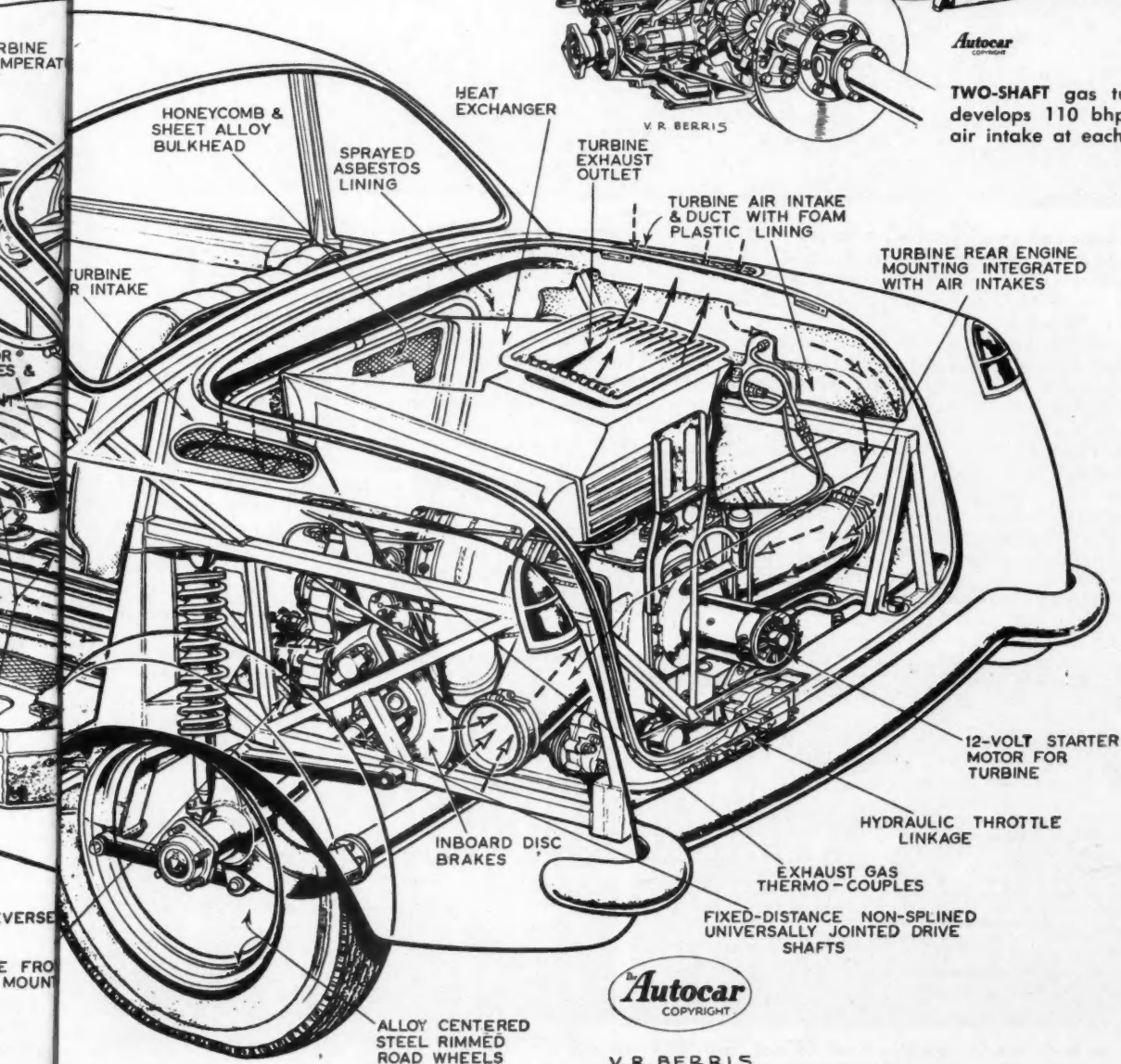


ALUMINUM FOIL was used in experi-
ments with exchanger heat losses. En-
gine compartment is asbestos insulated.



Autocar
COPYRIGHT

TWO-SHAFT gas turbine
develops 110 bhp, has
air intake at each side.



HONEYCOMB &
SHEET ALLOY
BULKHEAD

SPRAYED
ASBESTOS
LINING

HEAT
EXCHANGER

TURBINE
EXHAUST
OUTLET

TURBINE AIR INTAKE
& DUCT WITH FOAM
PLASTIC LINING

TURBINE REAR ENGINE
MOUNTING INTEGRATED
WITH AIR INTAKES

TURBINE
AIR INTAKE

12-VOLT STARTER
MOTOR FOR
TURBINE

HYDRAULIC THROTTLE
LINKAGE

EXHAUST GAS
THERMO-COUPLES

FIXED-DISTANCE NON-SPLINED
UNIVERSALLY JOINTED DRIVE
SHAFTS

INBOARD DISC
BRAKES

ALLOY CENTERED
STEEL RIMMED
ROAD WHEELS

Autocar
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V. R. BERRIS

Are AIR SPRINGS filled with



BUICK SUPER with air suspension (left) has about same angle of body lean in corners as coil spring Century (right).

MOTOR TREND Research Report by Don Francisco

IN 1957 BUICK LOST their third-place sales position to Plymouth, and if the performance of the '58 Buicks I tested for MOTOR TREND can be used as a yardstick of the performance of all the cars in the line, they are apt to lose another position or two this year.

Buicks for '58 are handsome cars, but in a sedate, conservative fashion that has little appeal to the young-in-heart. And their performance fits in perfectly with their appearance. In all there are five series in the line—Special, Century, Super, Roadmaster, and the revived Limited. Two wheelbase lengths accommodate all five lines, with a length of 122 inches for the Special and Century and 127.5 inches for the rest of the models.

The optional Air-Poise suspension system that is available on all '58 models made it necessary to test two cars so a comparison could be made between the air bags and the conventional coil springs. Our air-sprung car was a Super Riviera two-door, and the conventional coil spring job was a Century

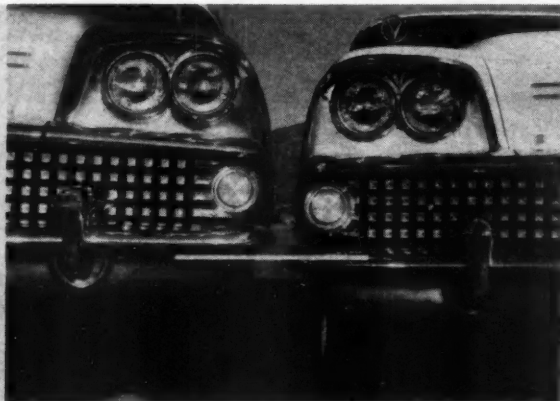
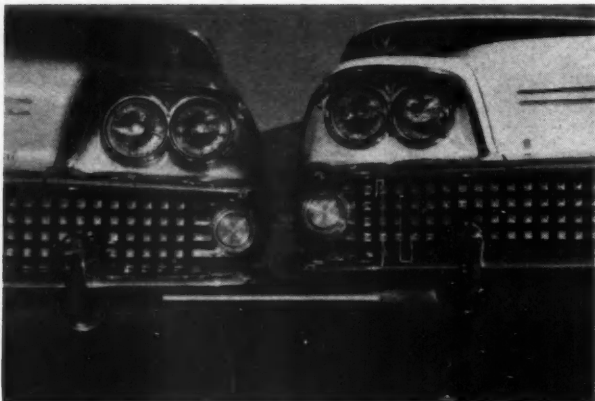
Riviera four-door. The cars had identical 364-cubic-inch, 300-horsepower engines, and in addition to their suspension systems they differed in that the Super had the new, supposedly-improved Flight Pitch Dynaflo and the Century had the old-style Variable Pitch box.

The Air-Poise suspension on the Super was supposed to be an improvement over the conventional coil springs by giving a quieter and softer ride; by maintaining the car on a constant level regardless of load and operating conditions; by lowering the car's center of gravity; by providing constant headlight beam level; and by providing the ability to raise the frame of the car approximately five inches to help get it out of snow or mud. Except for giving a quieter and softer ride, Air-Poise does everything claimed for it; as for the ride, the advertising claims are more wishful thinking than facts.

The air suspension system consists of individual air bellows that replace the conventional coil springs. The bellows are filled with air fed to them from a supply tank at the front of

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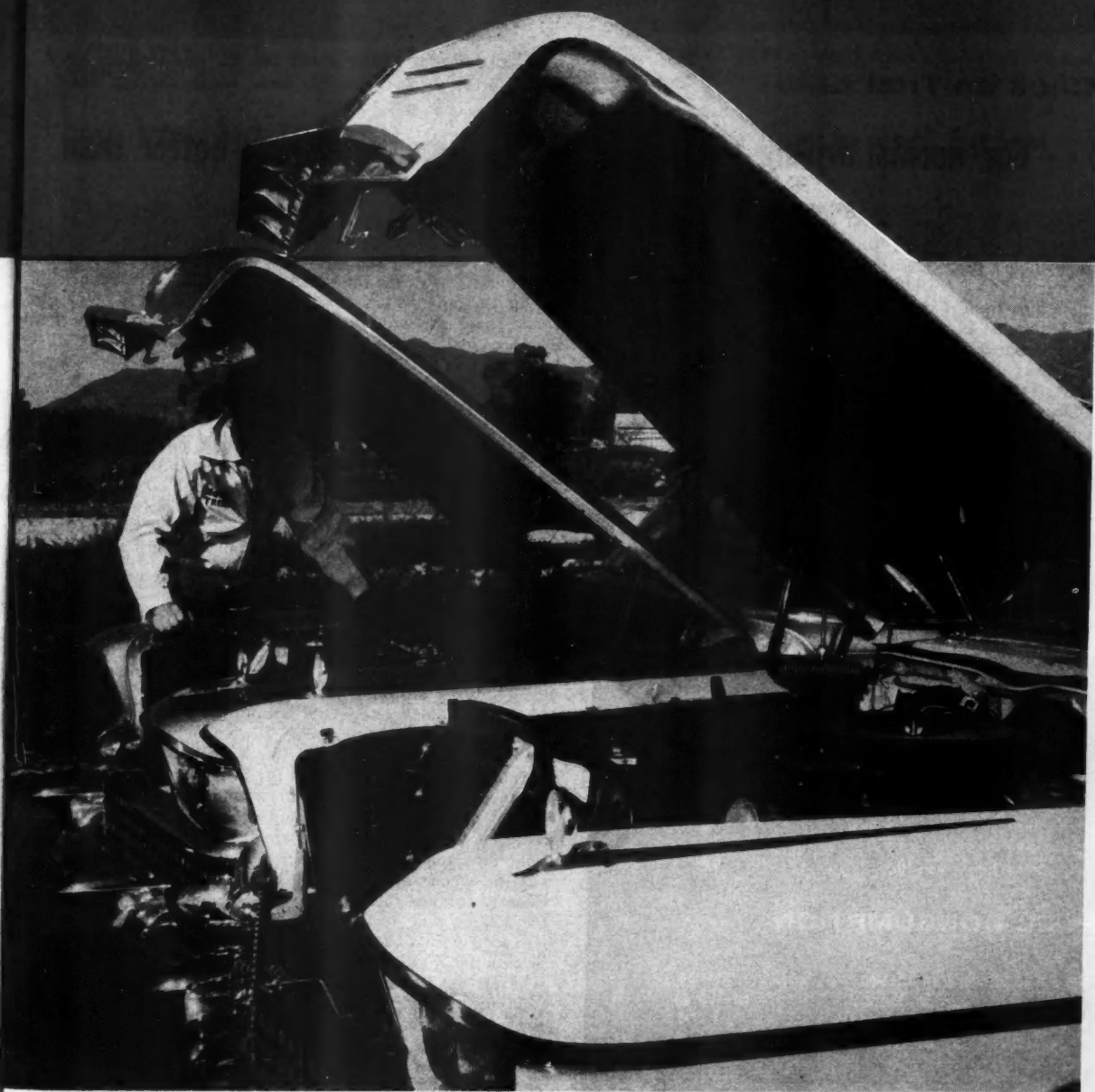
PHOTOS BY BOB D'OLIVO



SUPER (at left) with air springs is at normal rest. When raised, it is higher than steel-sprung Century alongside.

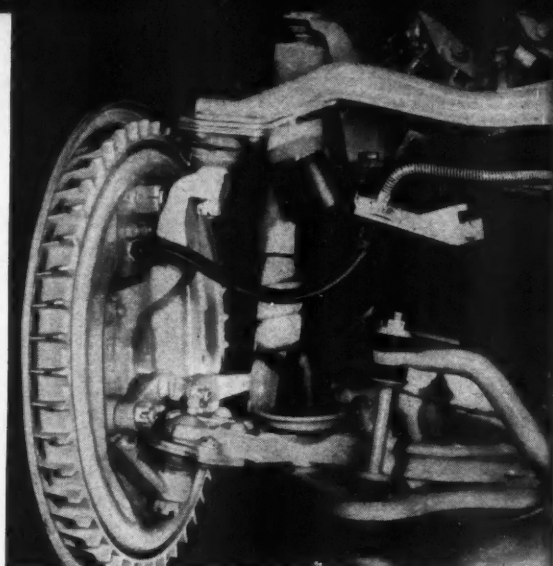
HOT AIR?

Rugged road test of Buick Super and Century deflates claims of air suspension superiority over steel springs



the frame. A small two-cylinder compressor driven by the engine maintains 290 pounds of pressure in the supply tank. Pressure in the bellows is maintained at 100 pounds. Torsional stabilizers at the front and rear of the car are designed to limit the tendency of the car to lean on turns. Three leveling valves, one for each of the rear bellows and one in the middle of the front stabilizer bar, act on a delayed action of approximately one second to increase or decrease the pressure in the bellows when the load in the car changes. The pressure is increased or decreased just enough to raise or lower the chassis to its normal height. The delayed action eliminates the possibility of the valves' acting to compensate for normal wheel movement, when the car is moving, and constantly trying to compensate for the changing height of the wheels in relation to the chassis.

The spring rate of the bellows is approximately 60 per cent of that of the coil springs they replace. This soft rate is designed to give an exceptionally smooth ride on smooth road surfaces; it is effective for only the first inch of wheel travel in either direction. In theory the suspension tightens



ALUMINUM FRONT BRAKE DRUMS, standard on all series except Special, have large cooling fins.

Buick on Trial Continued

"For normal driving aluminum brake drums aren't any better than

up after the first inch of travel and the spring rate increases to provide the necessary control for rough road surfaces. Conventional shock absorbers are mounted on an angle in the rear and in a nearly vertical position in the front.

The first thing I noticed about the air suspension was an uncomfortable lifting of the front of the car when it was started from rest. This action rocked the passengers back in their seats and it happened whether the throttle was opened easily or shoved to the floor. But this was only the beginning.

On glass-smooth roads the ride of the car was as good as it is in a car with coil springs, but on roads with irregular surfaces, such as concrete roads with ridges at a right angle to the direction of travel, the wheels would hop up and down in an uncontrolled manner. The wheels didn't move far but their movement was enough to set the car's frame and body to vibrating. The hood and fenders could be seen doing a jig in time with the wheels. On one of the concrete freeways in the Los Angeles area wheel movement became so bad at the limit of 55 miles per hour that the entire car and the legs of

its passengers were vibrating. On really rough surfaces, or when holes or filled spots in the road were hit, the wheels would go completely out of control and the hood and front fender assembly of the car would clatter like a tin barrel half full of tin cans rolling down a hill. Some of these bumps would cause the horn ring on the steering wheel to chatter. On turns and corners the car would lean badly, making it uncomfortable for the driver and passengers. The lean was bad even when car speed was reduced to the bare minimum.

Some types of dips at street intersections would cause the rear to bottom with a thud that shook the whole car. This happened only on dips that had the right angle and depth but it didn't matter whether there was a load in the car or not. Some dips that wouldn't make the rear end bottom would cause it to bounce unusually high. As it wasn't possible to tell from looking at a dip whether the car would bottom or bounce, I got to the point where I would just grit my teeth for all of them and take what came.

FAST DRIVING on desert roads and winding mountain roads brought out some good and bad handling characteristics of the cars that couldn't be spotted in town and on the freeways. On straight, fairly smooth roads the Super handled well enough. When dropping into the dips common on California's desert roads, the frame would bottom hard on the rear axle and front suspension members. When climbing out of the dips the chassis would wallow like a small boat in a heavy surf. One side of the car would lift in relation to the wheels and then the other side would lift, causing the car to roll from side to side. This gave a feeling of anything but security; however, the car always came out of the dips headed in the right direction and it wasn't necessary to correct with the steering wheel to keep it going straight. In some dips the Century handled in much the same manner except that all the actions were reduced. It bottomed less often and with less severity and the wallowing action was less pronounced in that the front end did not rise as far. Roll from side to side was also less severe.

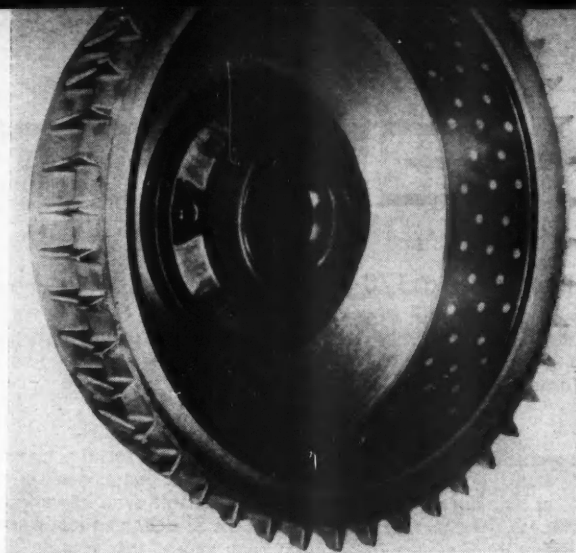
In the mountains the cars handled surprisingly well on sharp turns after they had reached the limit of body lean. Once the bodies had leaned as far as they were going to, the chassis stuck well and went through the turns as well as anyone could expect for such heavy cars with the factory-

ACCELERATION

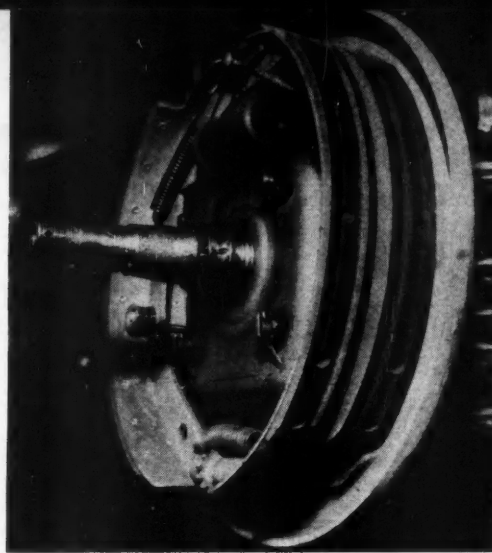
	SUPER	CENTURY
0-60	11.4 secs.	11.2 secs.
Quarter-mile	18.9 & 79.4 mph	19.0 & 79.7 mph
30-50	4.3 secs.	4.0 secs.
45-60	3.8	3.7
50-80	10.3	9.8

FUEL CONSUMPTION

Stop-and-Go Driving	8.5 mpg for 134 mi.	9.9 mpg for 103 mi.
Highway Driving	11.3 mpg for 1021 mi.	12.3 mpg for 461 mi.



PEARLITE IRON INSERTS give perforated appearance to drum friction surface; severe use proved better cooling.



BRAKE SHOES on Buick front wheels are unusually wide; note center groove that separates lining.

cast iron, but under severe use, they allow brakes to cool faster . . ."

recommended air pressure in the tires. The tires had built up from the cold 24 pounds to about 28 pounds, which is far from enough for fast mountain driving; they squealed in sharp turns.

The Super had a tendency to lift the inside rear wheel on some turns. The wheel lifted just enough to cause its tire to lose traction. This was undoubtedly caused by the stabilizer bar on the rear of the car that is installed with the air suspension. The Century didn't lift its wheels, but otherwise it handled about the same as the Super. All body movements in relation to the wheels were much less severe than with the Super because of the Century's stiffer suspension.

The self-leveling feature of the Air-Poise functioned perfectly and the car adjusted itself to its normal level regardless of the number of passengers in it. The suspension system on the test car didn't give any trouble with air leaks but I understand leaks are a common complaint of owners who have purchased cars with Air-Poise. With pressures as high as 290 pounds per square inch it is understandable that the possibility of leaks would be high; however, correcting them is usually merely a matter of finding them and tightening the faulty connection. Most leaks of this nature are probably the result of careless assembly when the cars were built.

The frame can be raised approximately five inches by pulling a knob under the dash. This must be done before the car is raised with a jack so the self-leveling feature of the system will be rendered inoperative and not be damaged. It is also recommended that the frame be raised when the car is lifted with a hoist. Pushing the control knob in after the car is lowered allows the frame to return to its normal position.

Air suspension has been used for some time on buses and apparently it is successful on them; however, on the Buick I tested it was a most undesirable feature. Instead of being better than conventional springs, it was much inferior. The feeling it gave was the same one would get from a car with conventional springing and badly out-of-balance wheels and tires that were fastened to the frame with rubber bands—and small ones at that. The out-of-balance possibility was ruled out by running the car on new, extremely smooth asphalt roads. On these roads the wheels wouldn't bounce at any speed and they remained under control until the surface of the road changed.

Air-Poise could probably be made to function as well or better than steel springs by increasing the rate of the bellows and possibly installing more severe shock absorbers. These changes wouldn't be too drastic to make. It is possible that development work on the system was rushed to bring it out with the air suspensions of the competition and that further development work will iron out the deficiencies of the present system.

AS A WHOLE the behavior of the conventional suspension on the Century was much better than the Air-Poise. There was no nose rise when the car was started from rest, and on freeways and smooth roads there was no objectionable wheel movement. Road irregularities could be felt through the body, though they were not objectionable. On really rough spots the wheels would bounce more than they should but again not nearly as severely as with the air springs. The car was much more stable than the Super under all conditions. Roll on turns was considerably less than with the air bags and well within acceptable limits for a car the size and weight of the Century. The car could be made even more stable and the ride improved by the installation of stiffer shock absorbers.

This is the first year for the new Flight Pitch torque converter. Internal changes in the Flight Pitch include an additional turbine and a higher torque-multiplying ability than that of the Variable Pitch. Now it is felt that the L position is not necessary. As far as driving characteristics are concerned, there is considerable difference between the two converters. With the Flight Pitch, all forward driving is done with the selector in D, but a G position has been provided for retarding the car on downgrades. When the selector is in G, the converter and the engine are used to slow the car. The ratio of G in comparison to D is so low that it isn't possible to use it for fast acceleration. The Variable Pitch converter still retains the L position and this can be used for retarding the car or for better acceleration at low speeds.

THE FIRST IMPRESSION I got when I stepped on the throttle to get the Super under way was one of extreme slippage somewhere between the engine and the rear wheels. Engine speed went up with throttle movement, but the car didn't accelerate as it should have. To get the car moving fast enough to keep up with normal traffic it was necessary to push the

continued on page 56

LIGHTWEIGHT

Steel-block Super Sport engine packs a 170-hp wallop
into 120 cubic inches . . . and all in 180 pounds

by Ed Tomerlin

AT LONG LAST! After years of drought, after weary decades of lost prestige and frustrated ambition in the field of sportscar competition, the United States finally has a contender for high-performance, small-displacement honors. It's a radical new two-liter (120-cubic-inch) engine called the Super Sport, and from the looks of early performance figures Maserati had better move over.

Builders of sportscar "specials" and others who have seen the amazing little plant are excited over its potential for a well-designed track car, and a noted builder is already at work on what will probably be the first racing application of the SS. What's more, this hot little detonator has been designed to drop right into MGs, Healeys, and the like, using the same engine accessories and accepting the transmission without so much as an adaptor ring. Apparently the American sportscar

fan finally has a Class E engine to flip his soft-top about!

Just how good is the Super Sport? Well, figures don't lie—at least not when they're taken off a reliable dyno in working order. The first time on the stand the SS delighted its owners by climbing steadily to 6000 rpm, and at that reading the little mill was already pounding out an ambitious 145 horsepower! By way of comparison, consider that the rugged Triumph TR-3 gets only 100 hp out of its two-liters displacement; the AC turns out 90, the Mercedes 190-SL 120, and the Bristol—one of the hottest production jobs on the track today—only 125. What's more, some quick slide rule work indicates that the SS, under full competition tuning and optimum conditions, will operate in such heady company as the 2000cc jobs of Ferrari, Osca and Maserati!

Its creator and designer, Lloyd Taylor of Los Angeles, has lived and dreamed this engine for something like 20 years. Different versions of the SS have gone through many and various stages, including the powering of motorboats, midgets and the Crosley sedan.

As to how serious a contender the SS can be, a representative of the newly-formed company has this to say: "With proper competition tuning, the best possible cam, ignition and carburetor setup, Mr. Taylor's figures indicate we should get 170 horsepower at 7600 rpm . . . and Mr. Taylor has a habit of being right about these things."

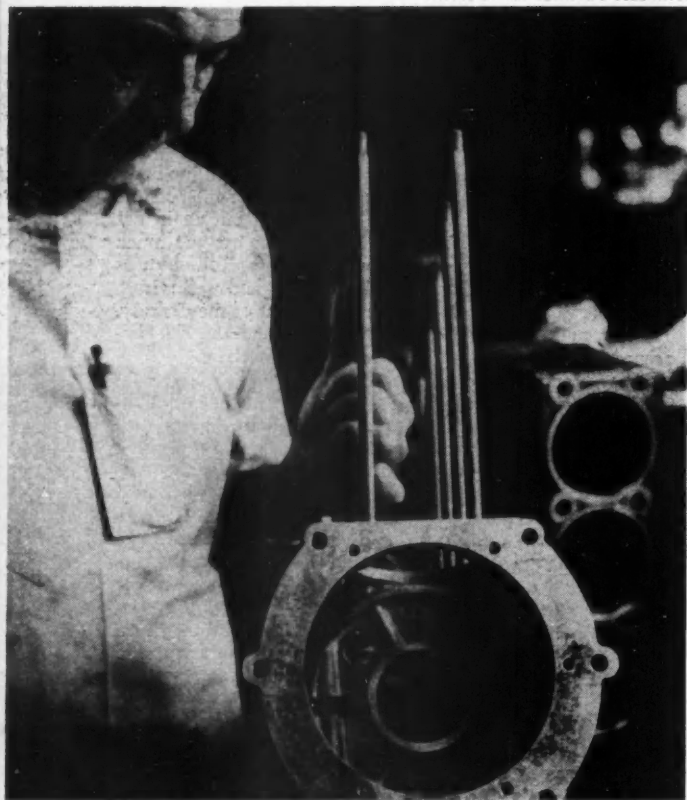
The first manner in which the SS differs from the ordinary is in the construction of its block: it is made of *steel* instead of cast iron. This serves a number of advantages, but two stand out in particular: light weight, and rapid heat dissipation. Actually, the heat-transference of cast iron and steel is almost identical, but the difference in relative strength means a steel block can be just one-third the thickness of a comparable casting. What's more, with steel the thickness of the walls can be controlled to a far greater extent, eliminating "hot-spots" and other attendant difficulties of core castings. The fabricated block also allows for complete integral water-jacketing. All these factors add up to an engine that runs far cooler and, thus, far more efficiently. Where the savings in weight is concerned, it might not mean much in a Detroit cruiser, but to the power-to-weight-conscious sportscar, it's of critical importance.

To be a true "dream" sportscar engine, the SS has to be adaptable to popular marques, too. Thus, it is delivered stock with mounting pads that fit the MG and Austin-Healey perfectly. Its bell housing will accept the transmission of these two makes with no alteration of any kind—of most others with a simple adaptor ring. The SS engine runs like a watch using standard S.U. carburetors and Lucas ignition components. Owners of MGs, Healeys, TRs and the like need only disconnect the carcass of their worn-out engine, drop in the Super Sport, hook up the existing equipment and press the starter. The lighter front end means even additional performance and should improve handling by lessening the car's tendency to plow the forward wheels.

The price, when quantity production has been attained: approximately \$800.

/MT

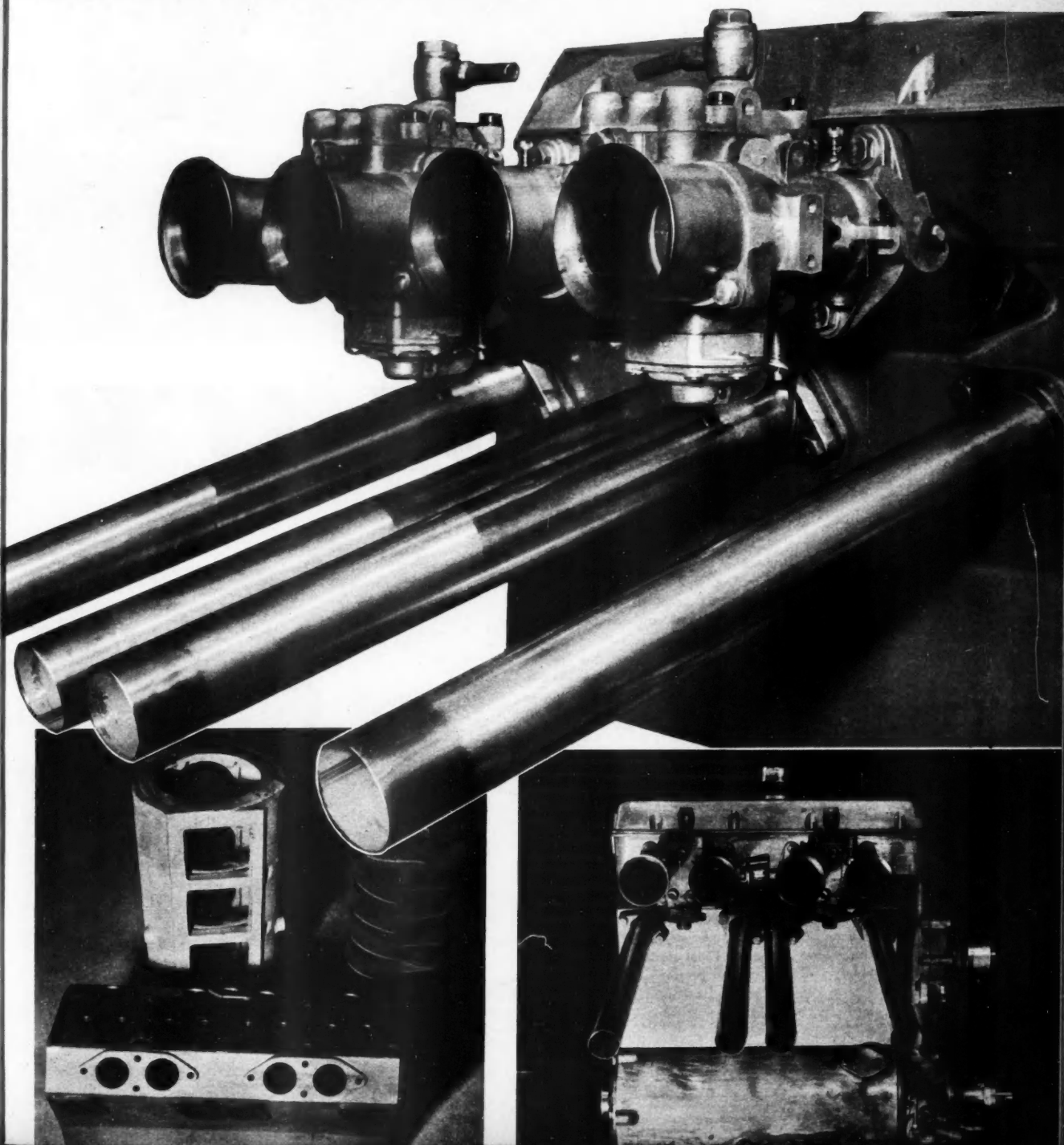
PHOTOS BY PAT TERRY AND OCEE RITCH

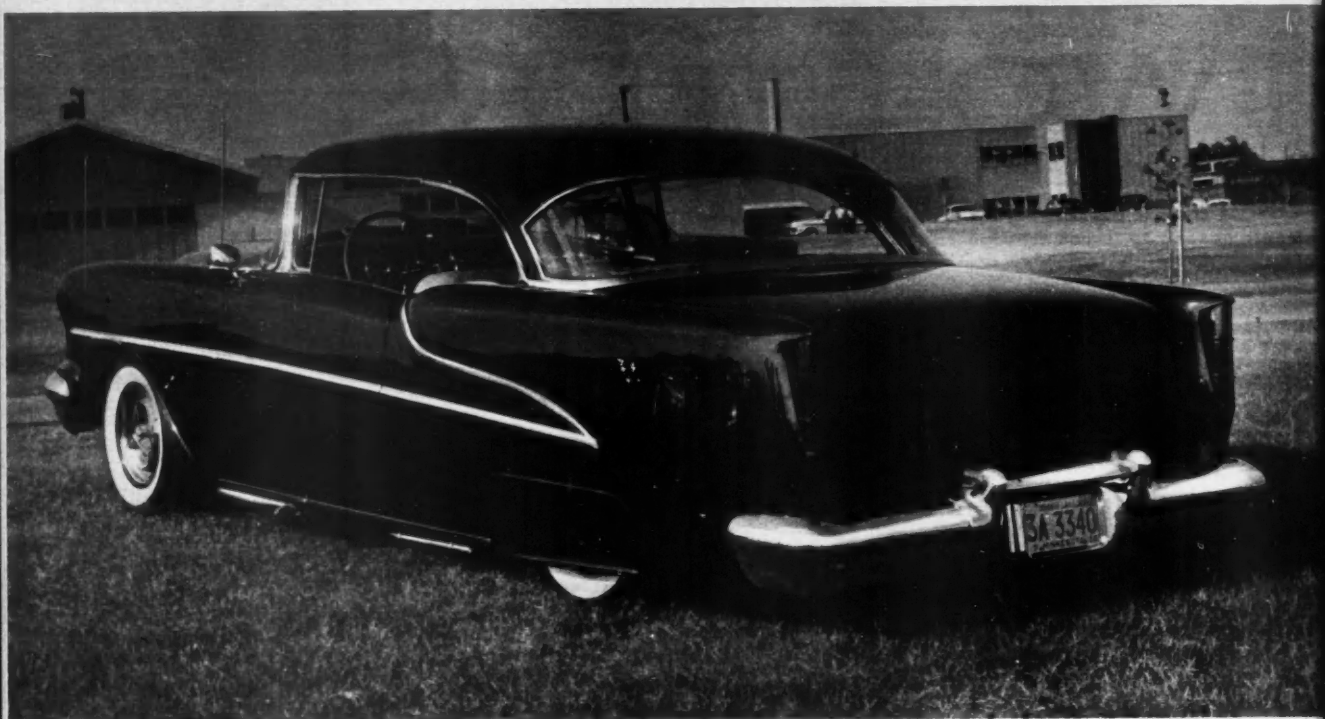


DESIGNER LLOYD TAYLOR examines crankcase of new American sports car engine now going into production.

TWO-LITER

RADICAL ENGINE promises big horsepower from small displacement; has 12 to 1 compression ratio, Solex carburetors. Its light weight plus reliability stem from the aluminum barrel crankcase, the welded block, and the hollow-core crankshaft.





*Photo Story
by James E. Potter*

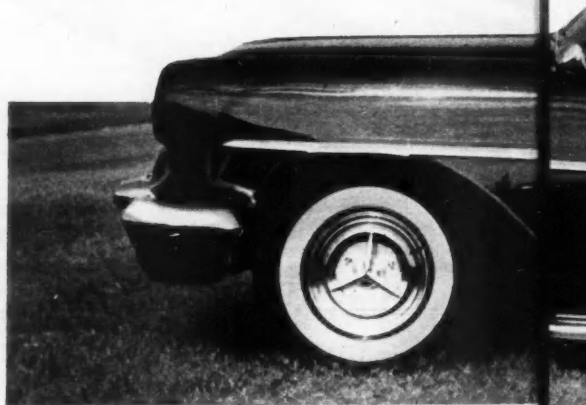
BLACK

NOT ALL RESTYLING of automobiles is grotesque, although this was the overheard opinion of a well-dressed middle-aged lady at a recent custom car show. As proof of this fallacious statement, we offer this cleanly executed and conservatively customized 1955 Oldsmobile hardtop.

Norman Werp of Anoka, Minn. was conscious of this "elder-citizen" viewpoint of what youths were doing to their cars when he tackled his already nicely-styled Oldsmobile. He wanted something that was individualistic, but would still retain the esteem of his parents and their friends.

With these thoughts in mind, he did the usual nosing and decking, frenching of headlights, and installing of electric push-buttons for doors and rear deck. Then came DeSoto grille teeth on the Olds center bar, the assembly floating in the molded grille shell. Oblong-shaped parking and turn-signal lights were put on either side of the teeth. At the rear, '55 Chrysler tail lights replaced the stock Olds units, and twin exhaust stacks were mounted on either side. Conservatively lowered six inches by cutting the front coils and using lowering blocks at the rear, the custom also received an interior transformation, using coral and gray rolled and pleated Naugahyde upholstery. To finish the job, all garnish moldings were chromed. Final result: a black beauty worthy of everybody's admiration and praise.

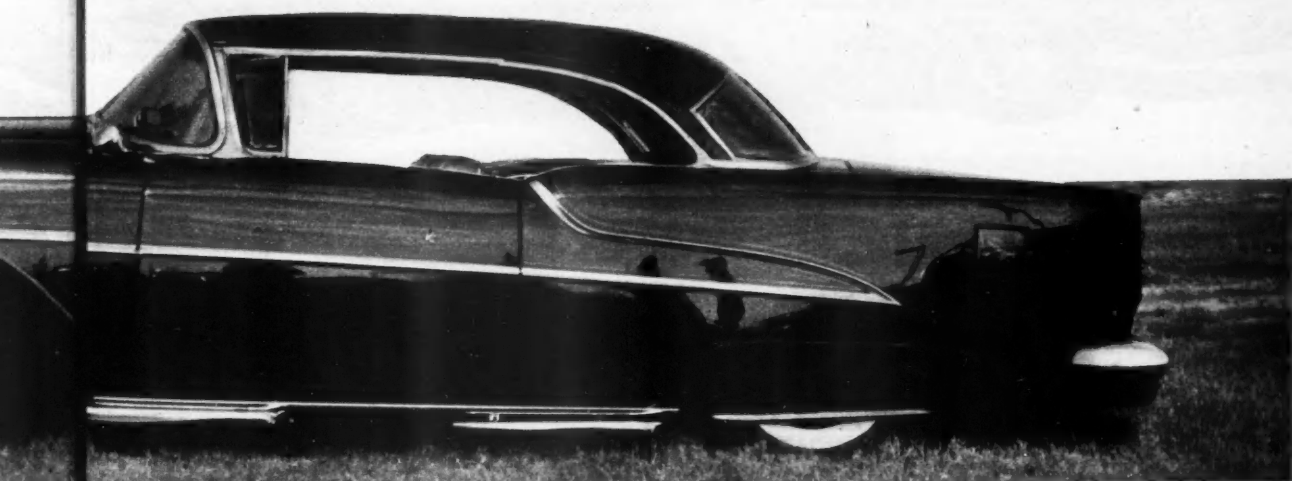
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A study in



K BEAUTY

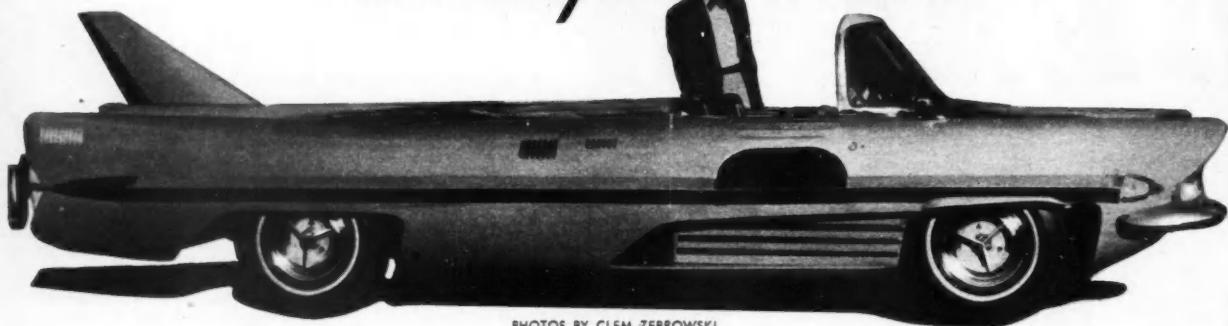


n conservative customizing



PROUD OWNER behind centered steering wheel glances back past striking fin, rear-mounted engine.

"They Call It a Beautiful Beast"



PHOTOS BY CLEM ZEBROWSKI

by Raymond Besasie, as told to Clem Zebrowski

FIGHTER PLANES inspired my son Joseph (25) to design the Besasie X-2. Then we built it in our Milwaukee repair shop.

"It's a tremendous attention-getter, startling viewers with its huge rear deck fin, steering wheel in the center, engine in the rear, absence of doors, and sliding, detachable steel roof. Some have called it a 'beautiful beast'.

"More than 5000 man-hours went into it over a period of two years. With the exception of the modified Cadillac engine with $\frac{3}{4}$ race cams and the latest Hydra-Matic drive, nearly every part was hand-made. The engine gets a six-pound boost from a blower of my own design. You see, I manufactured superchargers prior to World War II.

"The Cadillac engine, with supercharger engaged, peaks out at 5500 rpm. I figure it gives a 400-hp output, which should push the 3100-pound car to 135 mph. It's already been run at over

110 mph, and it accelerates from 0 to 60 mph in six seconds!

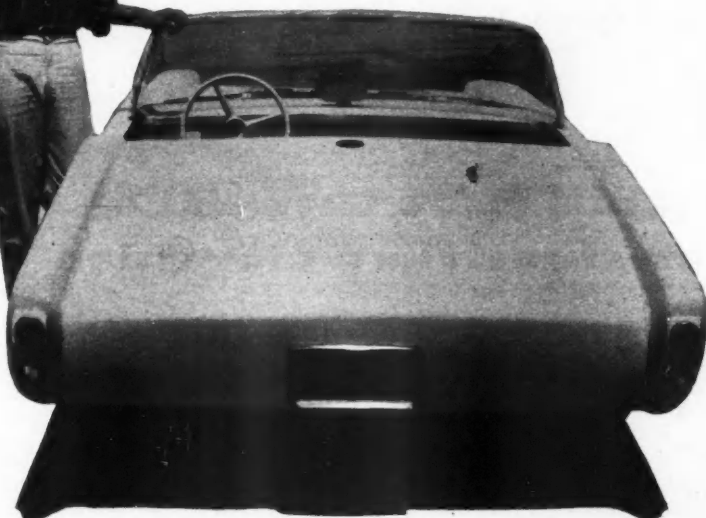
"We formed 16-gauge aluminum body sheeting over a chrome-alloy, tubular frame. Only three welds were used to join the body sections. We fashioned a full wrap-around windshield and a hydraulically-controlled sliding steel roof, which retracts at the flick of a switch. To enter you step over a kind of stile, take a seat, and then flick the roof switch to close. The roof has been designed so that it may be left open at any intermediate position. Windows are plastic inserts.

"The Besasie X-2 measures a full 19 feet six inches overall in length, and stands only 54 inches above the ground, roof attached. Road clearance is six inches while door-top height, without top, is just 34 inches.

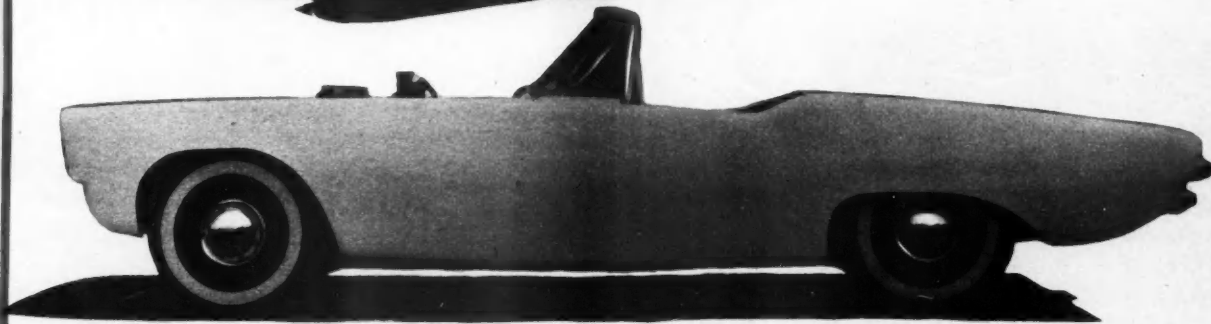
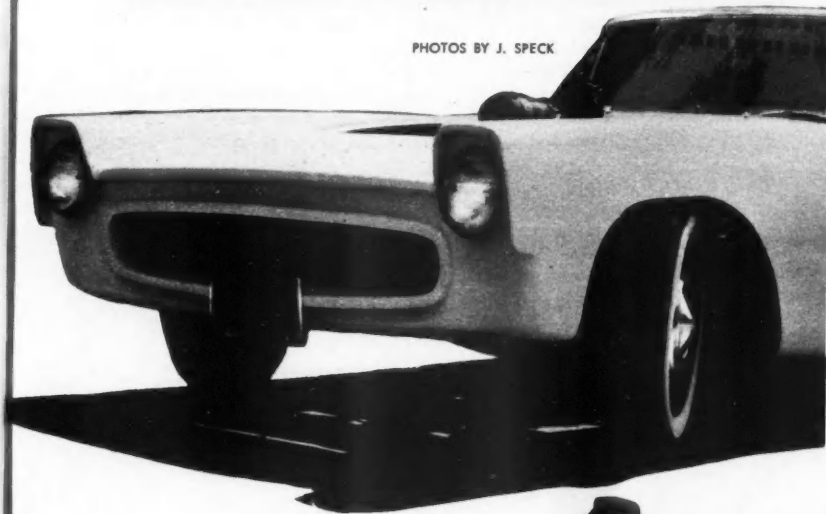
"I can't reveal the actual cost, but it would run more than \$20,000 if built to special order. At present, it's not for sale."

"I CALL IT THE 'FIASCO'"

by Lee Osborn, as told to J. Speck



PHOTOS BY J. SPECK



"THOUGH I CALL IT 'FIASCO' I don't think it lives up to its name.

"As a boat builder in Pasadena, Calif., I arrived at the unique technique for my car's body by using wood (mahogany at critical stress points), with an overlay of Fiberglas. The reason for the body's toughness is a secret I can't divulge. I can walk my 180 pounds around on top of the deck and fenders and the wood-glas doesn't give a fraction of an inch.

"I haven't had any previous experience professionally in car-building, but began my dream car a few months ago with a 1950 Ford frame, a Ford differential and 1936 Ford stickshift gearbox. I mounted a 1951 Mercury V8 about 18 inches behind the original location on the frame, to boost balance efficiency. The engine, completely stock, provides real potency. I wasn't trying for a hot rod. The design was what interested me.

"Later I'll add a hardtop, possibly shaped from a Thunderbird, cut to include gull-wing doors. The windshield is from a 1956 convertible Ford. A Volkswagen provided the 15-inch wheels.

"I bolted the wooden body to the shortened frame. Then I squeegeed on the Fiberglass, in boat-building style.

"Even though it's not completed, I drive the car, which is licensed officially as 'Fiasco.' I've designed a flat, Italian-styled hood cover, with air scoop, and am starting to build that."

/MY

BOAT-BUILDING technique is the design secret behind the "Fiasco's" styling. Fiberglass is overlaid on a wood shell.

the IMPALA influence

Most popular model in '58 Chevrolet line is basis for latest restyling conversion

POPULARITY OF THE IMPALA two-door hardtop after the new-car announcement by Chevrolet was immediate. Demand for these smart-looking, individually styled cars far exceeded the supply—a situation still existing even after they have been on the market for over six months. What caught everyone's eye, of course, was the individualized styling created by the raised scoop on the roof, the three tail lights in the reverse-contoured rear fender, and the extra trim designed especially for this model.

Although the demand for the car was great, many potential buyers admitted to one drawback—the car was available only as a two-door, which, because of the disadvantage of difficult entry and exit to the rear seat, made the car less desirable than a four-door. An enterprising employee of Enoch Chevrolet of South Gate, Calif., Louis Friedman, saw in this a challenge. He called in Bob

Sorrell, an expert in Fiberglas who also has something of a reputation for his unusual designs in speed machinery. A mold was made and other parts were added to the Impala "kit."

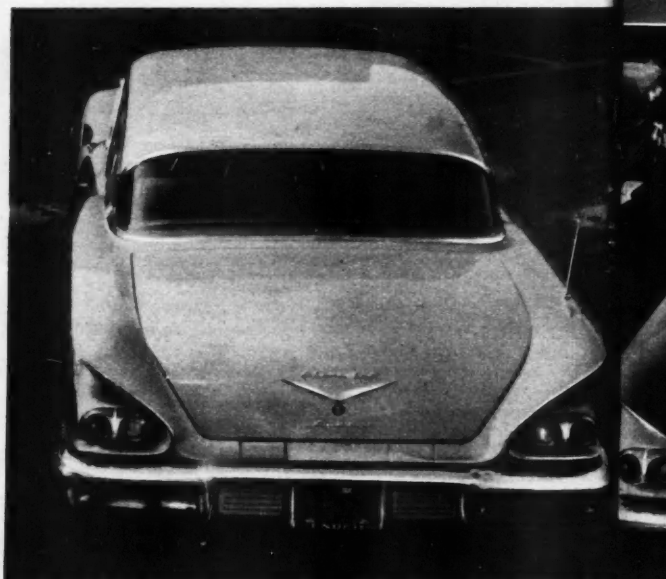
Before they could get a prototype Bel Air four-door completely assembled, interest mounted. The "Impala Special" four-door, as it was called, was an immediate hit.

Cost of the kit—consisting of a Fiberglas scoop, roof-top grille, two crossed flag emblems, two paint-divider emblems, two Impala nameplates, two bright metal body sill moldings, and one "Impala Special" nameplate—comes to \$75, plus installation. What is most interesting to the man with his hand in his pocket is that the final price of a converted Bel Air four-door, as completed by Enoch, is less than a stock Impala two-door with similar accessories and equipment. /MT

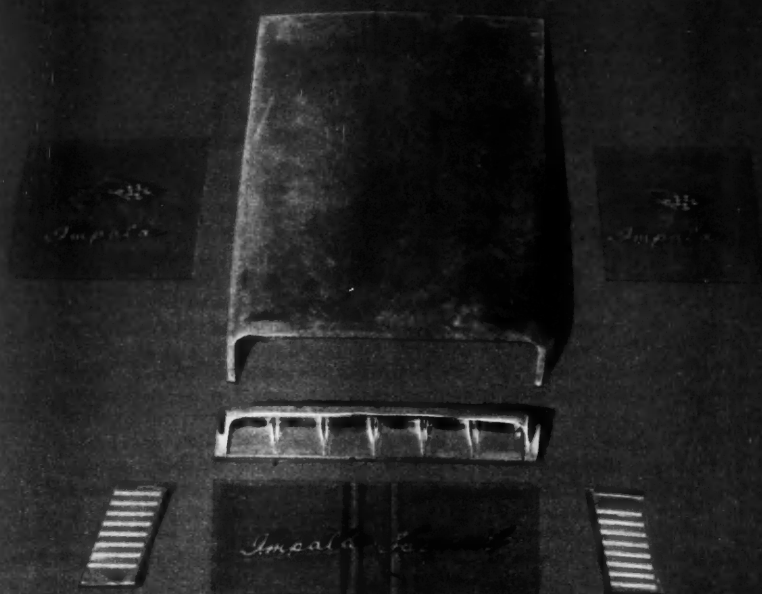
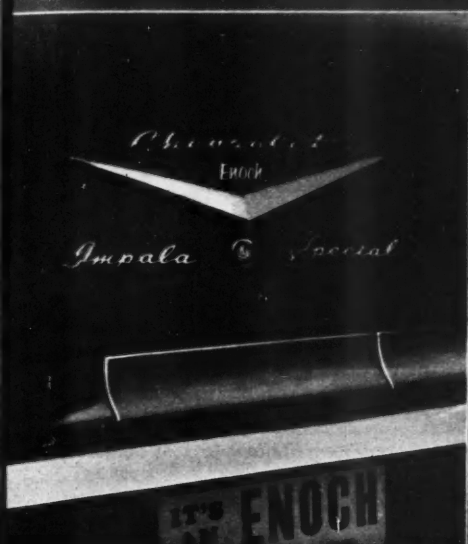
Photo Story by James E. Potter



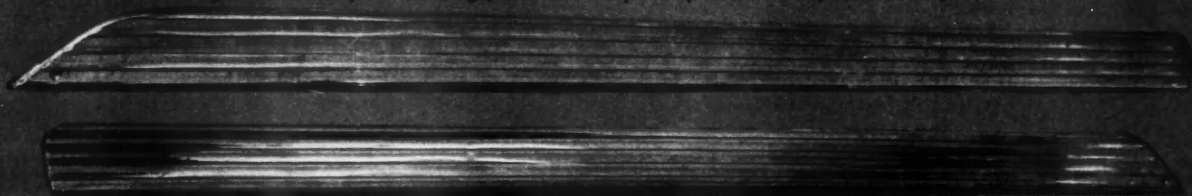
STOCK IMPALA in the Chevrolet Bel Air series is available only in the two-door hardtop styling. Though very popular with its special styling, it has its drawbacks.



FOUR-DOOR BEL AIR is the model used for Impala Special conversion described here, but other models in the Chevrolet line could be used with same impressive results.



IMPALA SPECIAL KIT consists of a Fiberglas scoop, roof-top grille, two crossed-flag emblems, two paint-divider emblems, two Impala nameplates, two bright metal body sill moldings, and one "Impala Special" nameplate. Cost: \$75.



FIBERGLAS SCOOP and roof-top chrome-plated grille are identifying features of new Impala "kit" developed and sold by Enoch Chevrolet Co. of South Gate, Calif.



SPECIAL TWO-TONE PAINT JOB has been designed to accentuate the body side trim and concave area within the rear door and fender. Emblems have distinctive touch.

IT'S TOUGH TO TELL who's enjoying himself more—the six-year-old driver or the 30-year-old builder-mechanic. But there is no doubt that they're both as happy as a winner at Indianapolis with their "skelter," tooling around the spacious parking lot at 40 mph.

The skelter gets its name from a contraction of "skeleton" and "quarter." Built like a skeletonized quarter-midget, the bodyless skelters are the smallest of back-yard bombs.

The center of skeltering can be found on any large parking lot. For example, by 10 o'clock any Sunday morning at Pasadena's Rose Bowl parking area, the crowd starts assembling. First, a few spectators, then the pick-up trucks and station wagons begin to appear . . . and the skelters start rolling out onto the asphalt.

So small that they're often carried in the trunk of the owner's car, the skelters seldom exceed a five-foot wheelbase. Strictly home-built, frames have beginnings in anything from an old GI steel bunk to angle irons and thin-wall tubing. Average horsepower is 2.5 with either a two- or four-cycle engine. Top speeds, though, range from 25 to 45 mph, with muffler attached. Unmuffled skelters are verboten in most cities across the nation.

One skelter builder, Andrew (Bud) Saffer of Glendale, Calif., has constructed three skelters. The third might be termed typical, except for the somewhat oversized engine and certain engineering refinements. The small-tractor powerplant drives a revolving rear axle by chain. A belt-driven brake on the axle is an improvement on the more common shoe-stop skelter. A power clutch working on a friction principle provides a smooth getaway. Acceleration is not neck-snapping—but when you're at 40 mph, sitting just three



FATHER AND SON share young-at-heart joys of skeltering.

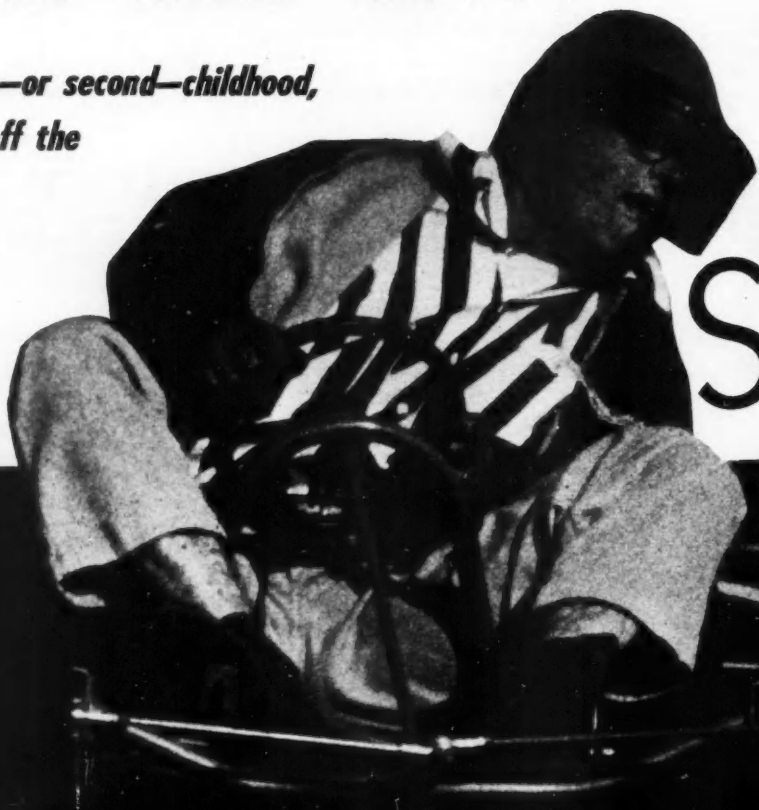
or four inches from the pavement, it seems more like doing 80.

F. J. (Dick) Atkinson, another Glendale enthusiast, built his skelter mainly of one-inch steel tubing. After the box frame was welded and a roll bar-styled seat welded into place about the skelter's center, a two-horsepower Briggs-Stratton engine with centrifugal clutch (of the power lawn mower type) was installed behind the seat, with belt drive to the left rear wheel. Then he

KARTS THAT GO . . .

***For kids in their first—or second—childhood,
40 mph four inches off the
ground is the most!***

by J. Speck





TEEN-AGER is proud of homemade five-horsepower skelter.

added a neatly-assembled steering column, steering, accelerator and brake linkage, pneumatic-tired wheels—and that was it. No body. As Atkinson puts it: "The welds were barely cool before we had it running. The idea is to GO!, not enter it in a concours."

Fuels for the skelters vary, with gasoline the favorite. Occasionally, methanol and castor oil are used.

In nearby Covina, the go-karts have a Grand Prix-styled track

to buzz around on, also a parking lot during the weekdays. These vehicles race (where skelters usually skelter around individually), and they're divided into three classes for two-cycle engines only, by the incorporated Go-Karts of America organization: Class A for engines up to 5.5 cubic inches, Class B for 5.5 to 11 cubic inches, and Class C for 11 to 16.5 cubic inches.

Average go-kart cost is \$200. Quarter-midgets, the beautifully designed and constructed racing cars for kids, average \$500 and more. Skelters cost anywhere from zero to \$125, depending upon how much material can be found in the workshop. Wheels and engine present the major expense, since they are usually purchased (wagon wheels are sometimes used, though). The skeleton-like vehicles aren't exactly pretty, but being home-built, they offer the owner plenty of opportunity for injecting his own ideas into the construction—like Saffer's power clutch, or bringing home an aircraft steering wheel from a surplus store for the skelter.

It's a hobby that dates back as far as the day someone first installed a washing machine engine in a wooden frame and took off down the road. But there has been a lot added to those original go-buggies. Safety, in particular. It's almost impossible to flip a skelter (even with only half a steering-wheel turn lock-to-lock), thanks to an ultra-low center of gravity and wide wheel-span. And, in a common bond, there's little or no road-running; it's all done on wide open parking lots.

Tools used to build skelters are found in almost any home garage. A light welding set is the only semi-specialized gear the skelter-builder needs—and the desire for something that Goes! /MT

HELTER ELTER

FRED BEINDORFF

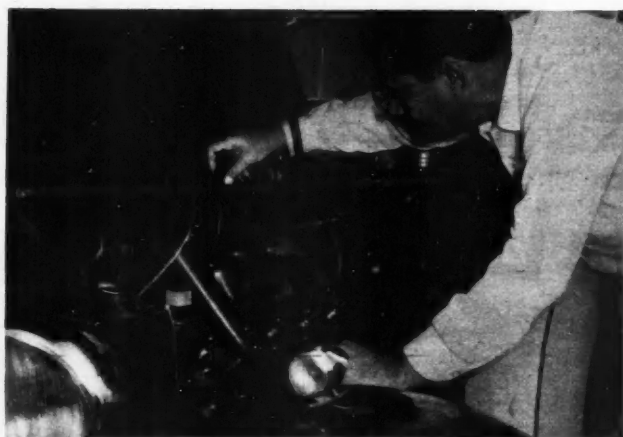


PANDORA'S PACKARD

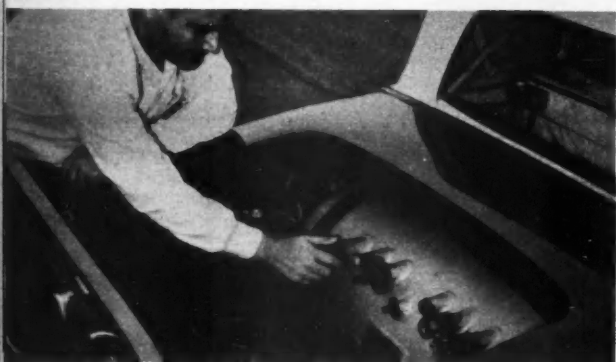
*by Robert J. Gottlieb
Classic Car Editor*



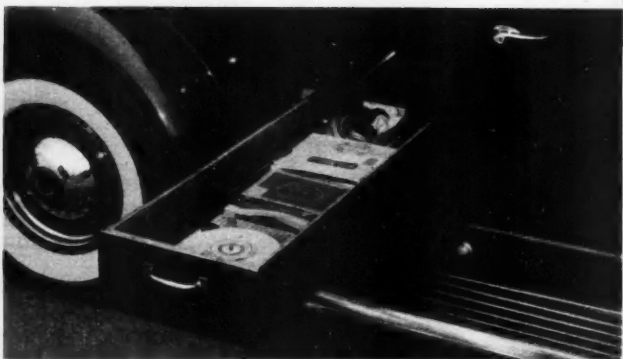
ORIGINAL INSTRUMENTS have been augmented with compass, altimeter, manifold pressure gauge.



V-12 ENGINE has carburetor equipped to handle either butane or gasoline. The heavy-duty generator develops 100 amps.

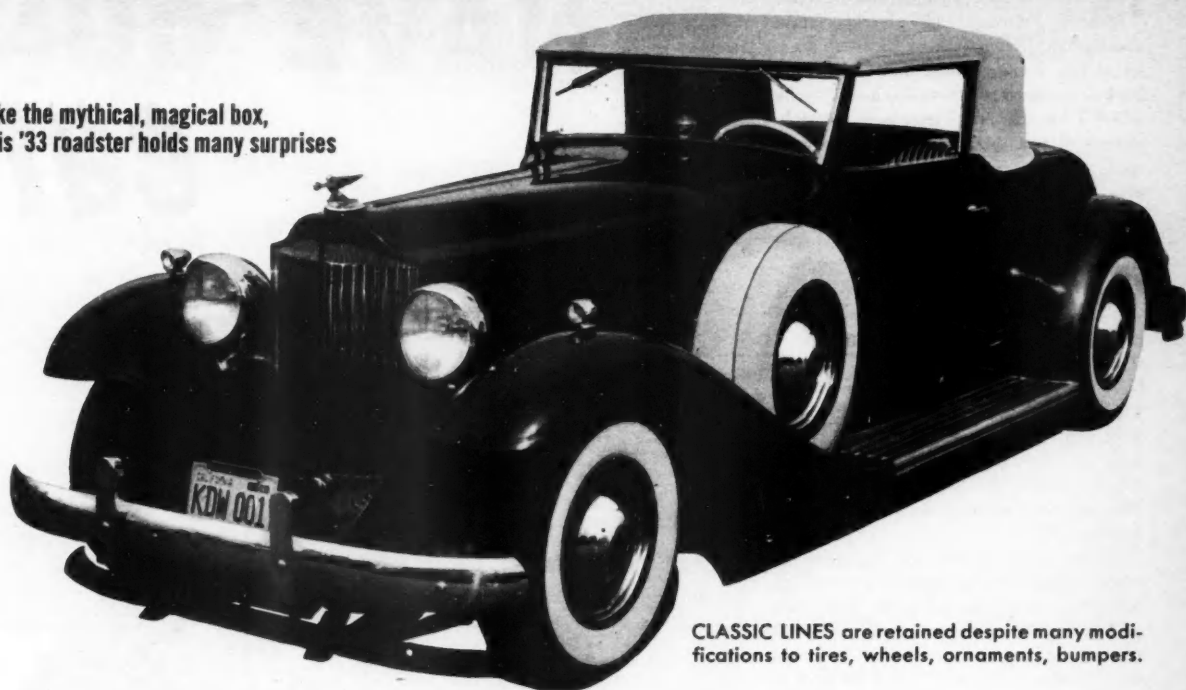


BUTANE TANK valves permit changeover in seconds to gasoline, with no difference in performance.



INGENIOUS DRAWER in golf bag compartment stores microphone cords, phonograph turntable, cables, tools, spare parts.

Like the mythical, magical box,
this '33 roadster holds many surprises



CLASSIC LINES are retained despite many modifications to tires, wheels, ornaments, bumpers.

ACCORDING TO GREEK MYTHOLOGY, Pandora possessed an intriguing box with amazing contents. Charlie and Helen Last of Covina, Calif. are owners of a Packard that makes Pandora's box seem insignificant — in terms of the number of hidden surprises.

The 1933 V-12 convertible coupe — designated by Packard as a "coupe roadster" — was purchased seven years ago in bad condition for \$60. Complete overhauling and modification have increased the Lasts' investment close to the original price of \$4500.

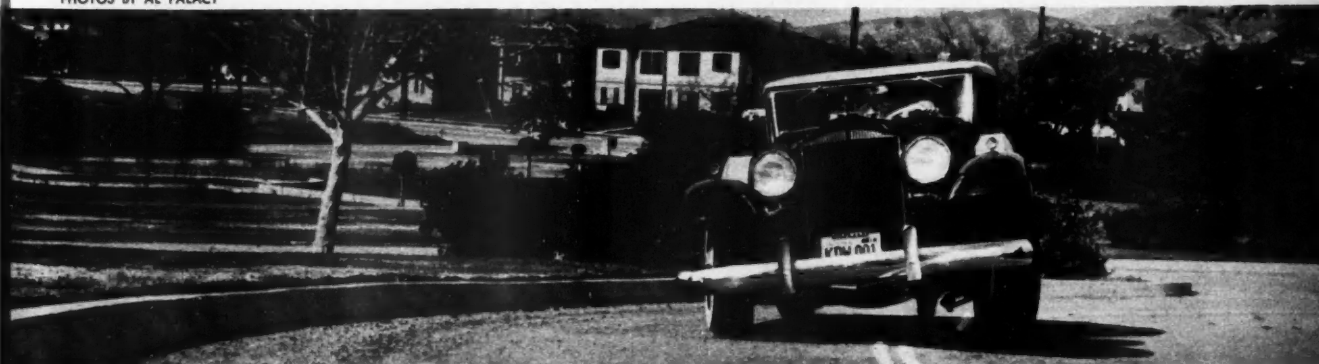
Most of the changes and additions are not apparent at first glance. The car is equipped to operate equally well on butane or gasoline; changing over takes only seconds. A public address system, with a Leece Neville generator powering the loud speaker equipment, shares the rumble seat compartment with the butane tank. The former golf bag compartment now accommodates a roller-mounted, body-width, pull-out drawer for tools, spare parts,

p.a. system components. Original mechanical brakes with vacuum booster have been replaced by hydraulic brakes. Engine modifications include milling the heads .060, grinding the crankshaft and boring the rods for Cadillac bearing inserts.

Exterior changes which might escape the casual observer include the substitution of 16-inch disc wheels for the 17-inch wire wheels, replacement of front and rear bumpers, installation of modern tail light lenses, removal of horns from front of car — and 18 coats of 1949 Cadillac cypress green lacquer.

Driving the 139-inch-wheelbase classic offered some pleasant surprises too. Ride control is manually adjustable from the cockpit: push a knob in for a stiffer ride, pull it out for a softer ride. Handling reflects this Packard's sports model heritage — the car corners better and keels less than contemporary classics. The V-12 Packard engine is smooth and quiet — this was no surprise. /MT

PHOTOS BY AL PALACY



LOWERED CENTER OF GRAVITY from 16- instead of 17-inch wheels improves cornering characteristics, also helps the ride.

THERE ISN'T A LOT of connection between Richard Paladin's daily transportation and Richard Boone's except that both are a lot of fun. I enjoy riding and I am really hooked on my new Devin-bodied Porsche where I have several horsepower available instead of just one. Not that I'm power-mad, you understand. If I were I'd probably have something big and hairy (there we go, horses again!), but what I enjoy in an automobile is the combination of virtues summed up under the term "handling."

For this reason I bought a Porsche. Once you have driven a Porsche long enough to become completely familiar with it (something like a horse, once more) it is a veritable jewel in the controllability department. The only comments to the contrary come from people who have been impatient and have not bothered to learn its habits. I don't have to dwell on this topic very long — Porsche's racing record speaks better than I can.

At any rate, I enjoyed my Speedster for quite a while but I was unfortunate enough to get it bashed while out in the boondocks on location. Not only was the front caved in, but the rear end got it too. The main damage was to the body but I decided to pull the engine and make a few modifications to it while the metal work was being done. (O.K., I like acceleration, too.)

About this time I heard about the Fiberglass "Monza"-style bodies Bill Devin is making up in Lancaster, Calif., and I looked into the deal. Bill's bodies weigh less than 100 pounds — between 75 and 100 depending on the size — and are as slick as a painted post. He advertises that he has a body to fit any wheelbase from 78 inches to 106 inches. The Porsche is 80 inches, so that looked pretty easy. We conferred about the project and he agreed to mount a body on the Porsche platform with a few little changes... such as two headrests.

Now this job is fairly simple and yet fairly complicated, depending on how much know-how you have. The big item is in the suspension. Porsche suspension, as you are probably aware, is by trailing links and transverse torsion bars, and when the body is removed and a lighter one substituted everything has to be realigned. (This would be true of any car, actually.) To get the wheels back in their proper relationship and to get the correct ground clearance, it is necessary to cut the front mounting tube, turn it slightly and re-weld it. At the rear, the trailing arm must be removed and re-inserted in the splines at a different setting. None of this is extremely difficult if you understand Porsches, but it must be done correctly or your beautifully handling car is *kaput*.

In addition, the gas tank was relocated at the front of the body shell and a new exhaust manifold setup fabricated. We retained the original Speedster seats and

HAVE ~~GUN~~ car



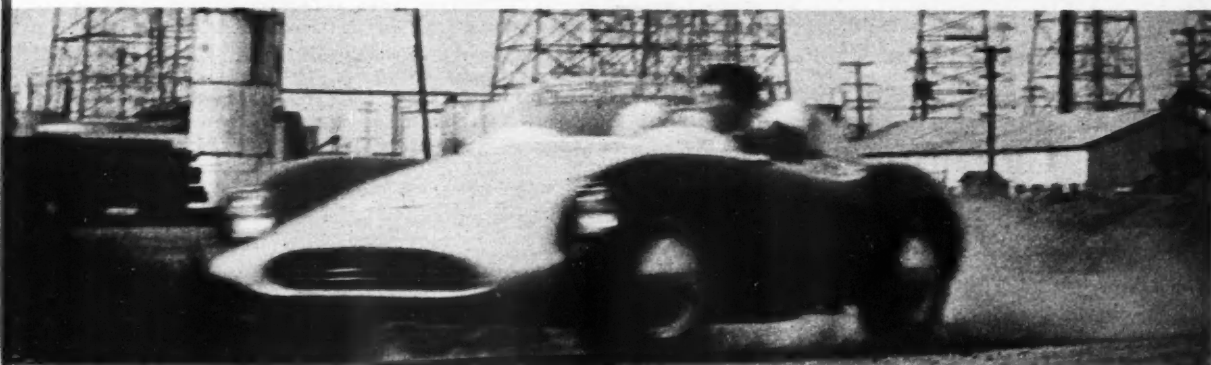
PHOTOS BY BOB D'OLIVO, OCEE RITCH

PORSCHE-DEVIN HYBRID (Devin Fiberglass body on Porsche chassis) is 300 pounds lighter than the stock speedster.



WILL TRAVEL (PALADIN)

**ON-CAMERA, RIDE STUDIO HORSE;
OFF-CAMERA, DRIVE DEVIN-PORSCHE**



had them re-upholstered to match the interior of the car. Instruments were mounted in a cluster above the steering column, much the same as in the original car. We even kept the turn indicator.

While Bill was transforming the exterior, my old buddies at K & T Automotive in Norwalk were going ahead with the engine. Tom Irving was in charge of the job which included porting, undercutting the valve guides, matching the manifolds to the ports, lightening the valves and increasing the tension of the springs. Nothing radical, just cleaning up the excellent factory design. The Porsche Super revs up real well in stock form but has a higher potential if the valve train can be lightened and run under more

pressure. Tom succeeded pretty well at his chore: my engine will turn 7200 without any strain and the flywheel came off at 7600 once while it was being tested at free revs! The engine wasn't hurt at all, incidentally.

When it all went back together I had a Porsche-Devin and I could travel. The new Speedster weighed in exactly 300 pounds lighter than stock, with full gas tank and assorted junk. This spelled acceleration because in a car this light to begin with, 300 pounds represents something like 20 per cent of the total weight. My 0 to 60 times showed a corresponding improvement, dropping from 11 seconds to 9.2 or 9 seconds flat depending on how I take off. I think it could be pushed real hard and

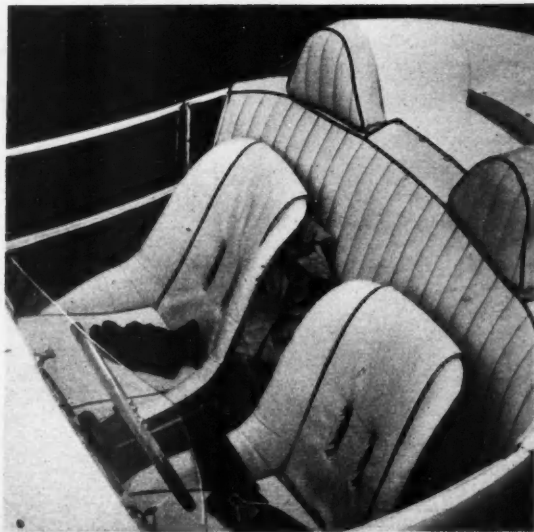
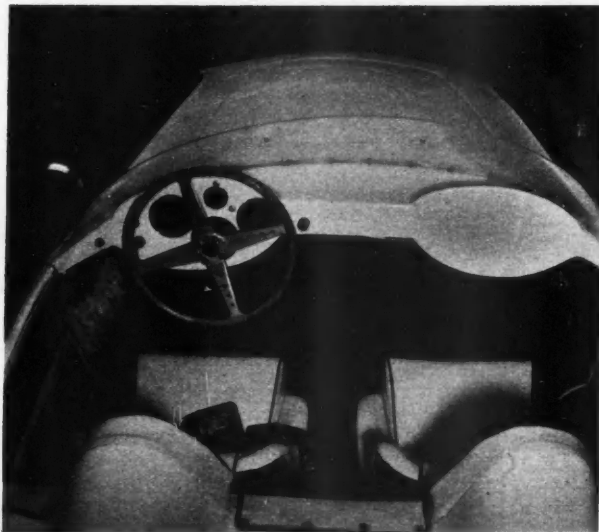
more than likely break 9 at a dragstrip.

How does it handle? Tremendously. Bill did a superb job of setting the suspension for maximum roadholding. It corners even flatter than the original Speedster and steers lightly and politely.

I have a favorite spot to try out the various changes we have made on the car—a lonely oil field road where there is no traffic and lots of room. We go out and check the car's acceleration and handling but without making any high speed runs, of course. In fact, I've never driven the car at anything like top speed. I appreciate it because I know it's safe and will take care of me in an emergency . . . sort of like a good horse!

/MT

CUSTOM INTERIOR includes racing wheel, padded headrests, recovered Porsche seats and the wide, competition belt.



GUADALAJARA, a city deep in Mexico best remembered in songs played by the Mariachis. Guadalajara, meaning "City of Rivers," with no river anywhere around. Guadalajara, the scene of the III Madrigal Road Races, ambitiously touted by the Club Velocidad as an "International Affair."

Arriving in this second-largest city in Mexico and seeing no pre-race revelry, even on the day of practice, made one wonder if there really was to be a race. No banners, just occasional posters tacked onto a few eucalyptus trees at the State Fair. Yet the next morning the roads were jammed with cars of every description — jostling, puffing, and pushing their way to the Madrigal.

At 11:00 Sam Hanks dropped the flag for the first starters and a VW, an Opel, two Fiat 1100 sedans, and several Fiat-engined specials were on their way around the 3.3-mile circuit. At the end of the first lap around the roughly rectangular narrow road that winds up and down two arroyos, the modified Volkswagen was in first place. That's where it remained to the end of the 10 laps with the Opel, driven by Ricardo Rodríguez, second.

The next race was a runaway for an Austin-Healey against

another Healey, a 190-SL, six MG-As, an MG-TF, and a Porsche 1600 coupe that went off the course on a very tricky, climbing S-bend. Luckily for the Porsche driver, even though the car landed upside down, he walked out after ending up on a ledge above another long drop that could have been fatal.

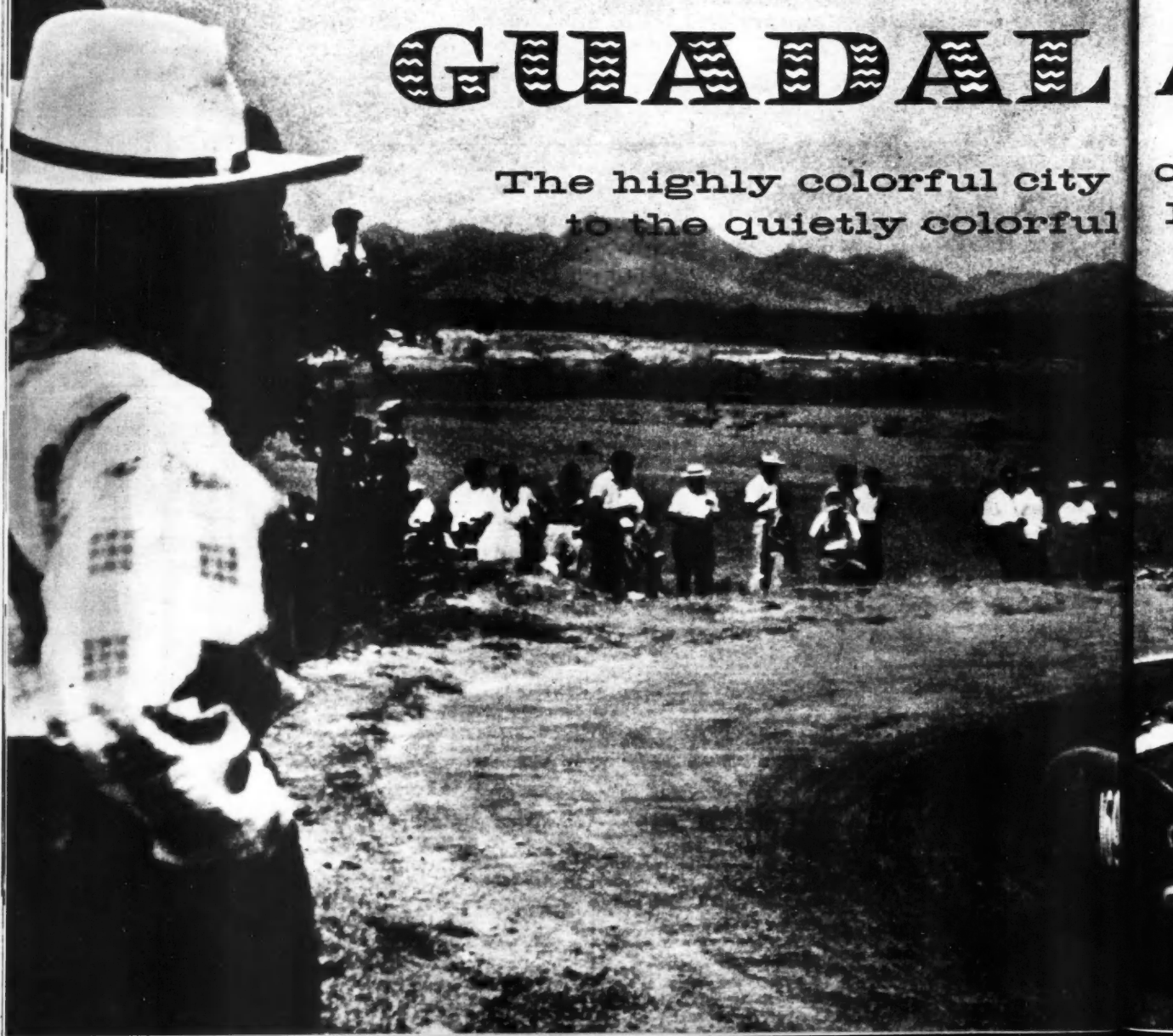
Not so lucky was the American driver of the Corvette the day before. Having only one practice lap to his credit, he hot-dogged it around on the next lap, lost control after the car leaped into the air, skidded off the course and crumpled the car and himself. No helmet, no seat belt, no life.

The "main event" involved a Porsche Spyder driven by Ricardo Rodríguez, a Corvette driven by his older brother Pedro, two more Corvettes, a D-Jaguar, and about a half a dozen specials, ranging from good-looking to ludicrous.

Outside of the first few laps, in which the American driver gave chase to the Porsche in his D-Jag, then retired with a burned-out clutch, it was no contest. The older Rodríguez might easily have taken second but his Corvette's brakes failed. So the "Cups and Glory" went to 16-year-old Ricardo, as it well should have. /MT

GUADALAJARA

The highly colorful city
to the quietly colorful





RICARDO RODRIGUEZ, aged 16, won key race in Porsche.



SAM HANKS studies one of many hybrid models entered.



UNIQUE DESIGN won stares but no victory.

L AJARA

of the song plays host
III Madrigal races



Photo Story by Walt Woron



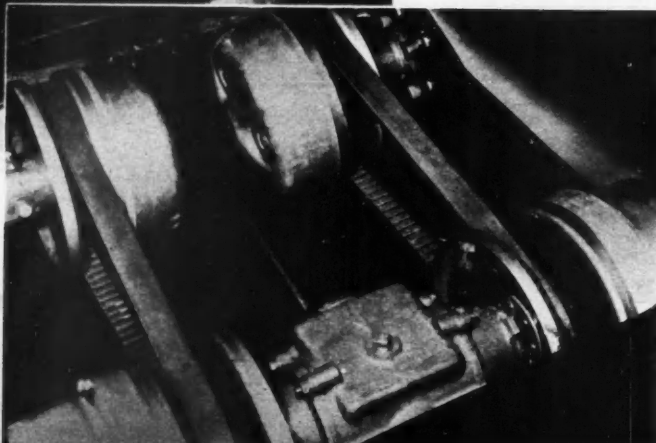
DUTCH AUTOMOTIVE FIRST

Here's Holland's entry in the small car race; it promises to be a four-wheel windmill



SIMPLE DASH, attractive upholstery, absence of a clutch pedal characterize the car's interior.

VARIOMATIC transmission uses V-belt drive with variable-diameter pulleys, permitting a wide gear-ratio range.



THE NEW DAF CAR, recently introduced at the Amsterdam Automobile Show, has two firsts to its credit: the first small car to offer an automatic transmission as standard equipment, and the first native car to be produced in the Netherlands since the Spyker ceased production 33 years ago. The 1268-pound DAF (for van Doorne Automobielen Fabriek) will be built in Eindhoven, by makers of trucks and trailers.

The DAF is a two-door four-seater sedan with unitized body, two-cylinder, four-cycle 22-hp air-cooled engine of 36-cubic-inch displacement, centrifugal clutch and automatic "Variomatic" transmission.

Built on an 81-inch wheelbase with front and rear track of 47 inches, the car has an overall length of 142 inches and a width of 56 inches. Power is transmitted to the 12-inch rear wheels by a centrifugal clutch and two pairs of variable diameter pulleys, each connected by a V-belt. Centrifugal weights and engine vacuum control the diameter of the driving pulleys, whereas the diameter of the driven pulleys is governed by spring and belt tension. Inasmuch as both pulleys of each pair have a variable diameter, the transmission has an infinite number of ratios between a low of 20 to 1 and a high of 4.4 to 1.

Suspension is independent both front and rear. Rear suspension employs coil springs and V-shaped control arms pivotally anchored both front and rear. Front suspension consists of a single transverse leaf spring and hydraulic shock absorbers which carry the wheels and act as kingpins. The need for chassis lubrication has been eliminated through the use of rubber bushings.

The DAF's air-cooled flat twin engine has an aluminum crankcase and aluminum cylinders with steel sleeve inserts. The compression ratio is 7 to 1. Fuel consumption is estimated at 40 mpg. Top speed at 4000 rpm is 57 mph. Two models will be built: a standard and a deluxe model. Price of the standard model in Holland is \$1050, including heater and Variomatic transmission.

— W. A. Kerhum

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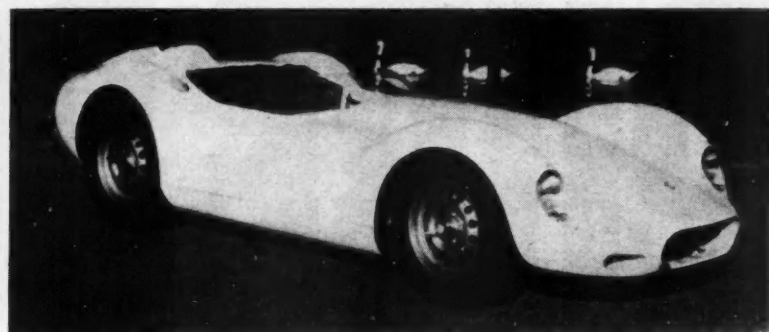


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GORDON WILKINS

'56 LISTER-JAG shares this new low frontal area design with '58 Lister-Chevrolet. Rating of 3.8 Jaguar and 4.6 Chevrolet engines is 300 bhp, top speed about 200. Cars have 12-inch disc brakes, 38-gallon tank in high tail.

AROUND THE WORLD IN THIRTY DAYS

continued from page 17
 sign includes electrically-operated windows and other American interior appointments. Output will be one car per day. The Ferrari 250-GT with Farina body will be shown the first time at the Paris automobile show in the fall. Scaglietti will still build bodies for Gran Turismo competition cars.

About mid-year Alfa Romeo will start production of the "Giulietta Veloce" for competition, equipped with a five-speed Porsche-type gearbox, which will also be used for other Giulietta models later.

Alfa Romeo will introduce at the fall Paris show a new Giulietta Spyder convertible with a four-inch-longer wheelbase, three more horsepower, five-speed gearbox and horizontally located steering wheel with divided steering column to improve driver's seat position. The hood will be longer and the windshield closer to the steering wheel to prevent air turbulence.

Alfa Romeo is also developing a new 1600cc engine for competition against Porsche.

The Fiat 1200, the prototype of which was seen at Turin last year, is now in production with these improvements: four doors opening forward, concealed hinges for the deck lid, new steering wheel, new honeycomb grille.



EASTOTO

EAST GERMANY'S new Trabant has plastic body over tin-steel structure. Air-cooled, two-stroke, 18-hp engine with four-gear transmission gives 39 mpg.

The Monza 500 is again slated for June 29th in the same manner as last year—10 American drivers against 10 Europeans in three equal heats for a total of 63 laps.

NETHERLANDS

Car sales in Holland for the first 11 months of 1957 total 54,538 against 61,438 in 1956. There seems to be a marked shift to lower-priced cars that is particularly influencing imports of American cars.

Amsterdam will no longer be the home for American Ford assembly—Antwerp will soon take its place. This also applies to German and French Fords. The Amsterdam plant will in the future confine itself to the assembly of British Fords and American trucks. The biggest Ford showroom in Amsterdam will also close.

RUSSIA

Moscow Radio reports that a new eight-cylinder car capable of 105 mph is on test. It's also claimed to have automatic transmission, power steering, and to seat seven passengers. It's called the ZIL 11.

SWEDEN

Saab of Sweden has made a deal with Norway to buy car parts worth the equivalent of 600 Saab cars in exchange for permission to export to Norway an additional quota of cars. It is understood that another Swedish car firm, Volvo, has a similar agreement.

/MT

5

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BRAKES

continued from page 26

this to 200 or more would be bound to reduce working temperatures. We face a tough problem on brake size, of course, because of the trend to smaller wheels. Some of the makers manage to squeeze 12-inch drums in a 14-inch wheel, but most have gone down to 11-inch brakes. Swept area per ton figures have not increased appreciably in the last five years, which isn't good. Lincoln has taken a big step on the new '58 chassis by expanding sideways to three-inch-wide linings. This could start a beneficial trend.

And then there's the old problem of the disc brake. One of the original ideas behind the disc-type brake was to use a caliper arrangement to apply the friction pads, and then have the disc out in the open air where it could be cooled effectively. Disc brakes designed on this principle—like the current Dunlop, Girling, and Lockheed production units—have been quite successful. But Detroit apparently isn't interested in any brake that isn't totally enclosed, where it can be protected from mud, water and road salt. When you enclose a disc brake you lose most of its cooling advantage. This was one of the disadvantages of the Ausco-Lambert disc brake used on the '49-'55 Chrysler Custom Imperials.

Other combinations have been tried experimentally by Detroit—like an enclosed plate-type disc brake running in oil—but the cooling problem was usually high on the list of headaches. Right now it appears that Detroit is leaning away from the disc brake idea. It has not yet been proved conclusively that this basic layout has any clinching advantage over a well-developed drum brake—and there is certainly not enough advantage to justify the extra cost. A combination disc-and-shoe brake may be the answer, though it seems that Detroit is doing more work on metallic linings than disc brakes these days.

So there's a brief look at Detroit's basic brake problem as it stands today. There are angles that we haven't touched on—like braking force balance between front and rear wheels, power assist refinement, lining wear, etc.—but these problems are by no means critical today. Our big problem is still one of handling heat. We have made several suggestions here that might help, without adding too much cost: Harder, higher-quality linings with a lower and more stable friction coefficient; leading-trailing or two-trailing-shoe front brakes in conjunction with better power assists, possibly using oil pressure or compressed air power; maybe finned aluminum drums like Buick's; and wider linings for more drum swept area per ton. Any one of these features would help significantly. A combination of two or more—well, we can hope . . . ?

/MT

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BUICK on trial

continued from page 33

throttle to the floor, where the converter ratio changed to a still lower pitch. At any position below the point where this lower pitch came into effect the slippage was so pronounced that throttle position had practically no influence on car movement.

Acceleration to pass another car was out of the question without shoving the throttle to the floor. Any throttle position that didn't bring the low pitch into action was inadequate to change the car's rate of speed quickly enough to pass with any degree of safety. This is ridiculous in a car that has an engine rated at 300 horsepower. With the throttle on the floor, car speed would pick up well enough for passing but until the foot was pulled out of the carburetor the engine would over-rev badly in relation to the speed of the car. The over-revving didn't seem to hurt the engine, but it didn't contribute to comfortable driving.

With a Flight Pitch converter, there isn't any halfway point in throttle movement for starting from rest and getting up to cruising speed again. Either the throttle is shoved to the floor to make the car respond at its maximum rate of acceleration, or the car takes its own patient time and gains speed slowly. The rate of acceleration is determined by the converter instead of by the driver and the throttle, as it should be. This characteristic, in a much lesser degree, has at one time or another been true of most automatic transmissions that have torque converters. At the present time, Dynaflo converters are, in this respect, by far the worst offenders in the industry. With the throttle on the floor the car accelerated well for a heavy car but the commotion in the engine compartment was embarrassing if there were other cars nearby. Once up to speed, the throttle could be backed off and the car would maintain speed without any fuss.

The Variable Pitch converter in the Century had much more throttle response at most car speeds than the Flight Pitch. Getting the car up to about 40 mph without shoving the throttle down far enough to shift the converter into low pitch was a slow process, but not too difficult if the throttle were kicked to the floor. Once 40 mph had been reached, throttle response to accelerate the car to higher speeds wasn't bad—it was so much better than with the Flight Pitch that the cars could have been made by different companies. Acceleration of the two cars with full throttle from a standing start was practically identical. In a drag race the Super would gain a half car length or so in the first few feet and then the two cars would hold their positions as long as the throttles were held down.

The Dynaflo converter, in any of its versions, might be considered as misdirected effort. Buick has clung to the Dynaflo with dogged determination, try-

continued on page 58

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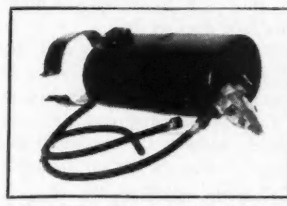
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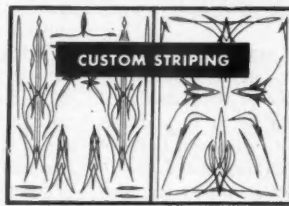
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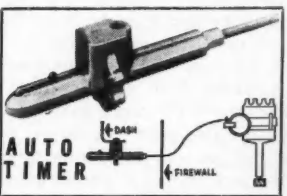
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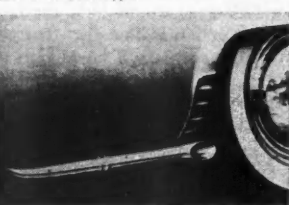
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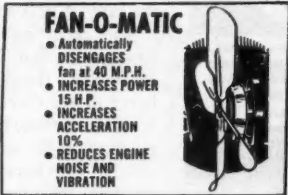
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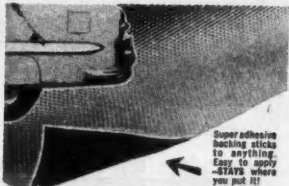
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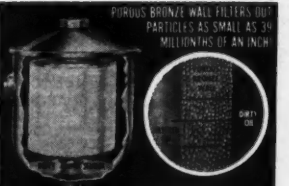


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BUICK on trial

continued from page 56

ing to improve it, but I feel they have a long way to go. The converter's no-shift feature and extreme smoothness would be pleasant additions to any car, though the loss of throttle response and acceleration that are the price of these features is too much to pay. It seems a shame to waste a 364-cubic-inch engine of the caliber of the Buick by hooking it to such a device.

TO EASE THE LOAD on the brakes on downgrades the cars can be retarded by moving the shift lever of the Super to G and the lever of the Century to L. Buick says that G position is to be used only for speeds of 45 mph or slower but I used it a few times at higher speeds to see what would happen. The action was sudden and positive. Both rear tires chirped as they broke loose for an instant and the car slowed at a rapid rate. When L position in the Century was engaged the tires chirped, as they did with the Super, but the rate of deceleration was not as great.

The retarding effect is primarily for downgrades but is also handy on level roads when the car has to be stopped in a hurry to keep from clobbering something. It's just as though your guardian angel is pushing on the front bumper. Using either of the converters in this manner takes much of the stopping load off the brakes. G and L probably shouldn't be used on level roads for anything but emergencies. In view of the factory recommendation, it probably wouldn't be wise to engage G position at speeds over 45 mph. The action in the converter has to be fierce to slow the car as it does and damage might be done to the transmission and driveline if G were used much at high speeds.

BOTH CARS WERE EQUIPPED with power steering that was entirely acceptable. The only feature of the steering not up to par was noticed in the Super—a slight oversteer tendency on winding roads. The oversteer wasn't bothersome except when the car had to be kept in a certain lane in free-way traffic. It is possible that a driver would get used to this after a few weeks with the car.

Pedal pressure required to operate the power brakes wasn't too heavy for comfortable left-foot braking, nor too light for good control; the length of pedal movement was longer than it should have been for power brakes—in my opinion. The stopping ability of the brakes was excellent under normal conditions. They didn't pull either right or left and it was possible to slide all four wheels at any time. In panic stops with all four wheels locked the Super had a tendency to promenade to the right after about 50 feet of sliding, but it could be held straight with little effort.

The aluminum front brake drums in-

troduced in '57 on the Roadmaster series are standard equipment this year on all series except the Special. The drums have large cooling fins and perlite iron inserts for friction surfaces. Rear drums are conventional cast iron. The aluminum drums are a definite improvement in the brake system, as we found during our usual fade test. For normal driving they aren't any better than cast-iron drums but under conditions of severe use they allow the front brakes to cool faster. This allows the brakes to stave off fading for a greater number of stops and also to recover more quickly after fade does set in.

With all the '57 automobiles and the '58s tested to date, six to eight cycles of MT's test were enough to cause the brakes to fail. With both the Super and the Century the brakes withstood 13 cycles of the test and failed to stop the car on the 14th. This can't be called anything but good for a U.S. production car. After the brakes had been allowed to cool for a few minutes they recovered their original effectiveness; however, they pulled one way or the other for a few stops before they returned to straight stopping again.

With the Super, the first five stops of the fade test were entirely normal; on the sixth and seventh stops slightly more pedal pressure was needed; on the eighth, ninth, and tenth the pedal was quite hard; on the 11th and 12th the brakes pulled badly to the side but the car could be stopped; on the 13th the pulling to the side got worse and the pedal pressure was very high; and on the 14th the car couldn't be stopped. On the 12th stop the odor of hot brake lining became quite apparent in the car and by the 14th stop it was very strong.

The brakes on the Century acted much the same as those on the Super except that they were better up to and including the 12th stop. The 13th and 14th stops were practically identical to those with the Super. The series of panic stops made earlier in the day with the Super undoubtedly had much to do with the difference in the performance of the cars. Such treatment can't help but take some of the grip out of a brake. Another factor in favor of the Century was its 140 pounds less weight. This isn't much but every ounce makes a difference when a car is being stopped.

The front end of the Super dipped badly when the brakes were applied and the rear end seemed to rise. As the car came to a stop both ends would rock up and down until they finally came to rest in their normal position. This action was almost as bad for slow speed stops as it was for stops at high speeds. Chassis bounce with the Century during brake applications was much less pronounced. It didn't cause discomfort to the passengers. This was due to the Century's stiffer suspension.

DURING THE ROAD TESTS of both cars and during the dynamometer tests with the

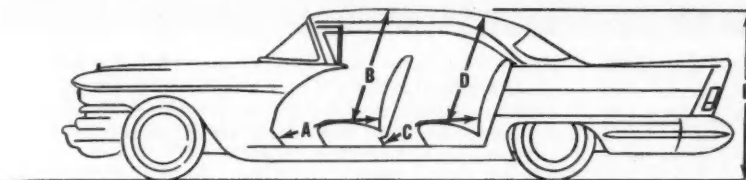
Century both engines ran as smoothly as fresh molasses in summer. They should, because with Dynaflo converters it is impossible to load them heavily. Mobilgas Special was used in both cars and there was never even the suggestion of ping from the engines. However, the tendency to ping would be influenced by the slip-page in the converters and the low mileage on both engines. It takes about 3000 miles for the carbon to build up in an engine to the point where it will cause pre-ignition, or to raise the compression pressure to the point where it will make the engine ping from detonation.

The Buick seems to have a good engine and is a favorite for engine-swap jobs because of its comparatively small exterior dimensions and light weight. In its stock form it has ample horsepower and torque for a light chassis. For the guy who really wants to go, there is some speed equipment that can be bought for it. Transmission adaptors are available that make it easy to connect the engine to Ford and Mercury transmissions and with a little ingenuity the engine could be adapted to transmissions of other makes. It would be a waste of money to add any speed equipment to an engine that is being used with a Dynaflo but the story would be different with a stick-shift box.

THINGS UNDER THE HOOD are laid out well for servicing. Spark plugs are easy to get at. The ignition distributor is still at the rear of the engine but it is of the external adjustment type that allows its breaker points to be adjusted while the engine is running, and the only way to work on a distributor if it needs new parts is to remove it from the engine and do the work on a bench where the work can be done right. The fuel pump is in an accessible spot and it is fitted with rubber fuel lines easy to remove and replace. The generator is high on the right side.

DRIVING THE SUPER was a disappointing experience, though the Century went far in redeeming its big brother. The Super would be much more enjoyable with conventional springs under it and with a Variable Pitch Dynaflo instead of the Flight Pitch. Both cars would be vastly improved with a transmission that would provide a more positive connection between the engine and the driveshaft. In their present form, these cars are for mink and dinner jackets, not slacks and levis; they are for driving to dinner and the theater, not for beating across town during rush hours; and they are at home at the front door of Ciro's, not in the parking lot at the local boiler factory. /MT

SPECIFICATIONS OF TEST CARS



	Century	Super
A—Front Legroom	43.0	43.5
B—Front Headroom	34.9	36.4
C—Rear Legroom	41.6	44.5
D—Rear Headroom	33.5	35.1
E—Overall Height	57.9	59.4

Buick Super

ENGINE: Ohv V8. Bore 4.13 in. Stroke 3.40 in. Stroke/bore ratio 0.82:1. Compression ratio 10.0:1. Displacement 364 cu. in. One 4-bbl carburetor. Dual exhaust. Advertised bhp 300 @ 4600 rpm. Bhp per cu. in. 0.82. Piston speed @ max. bhp 2607 ft. per min. Max. bmep 165.7 psi. Max. torque 400 lbs.-ft. @ 3200 rpm.

TRANSMISSION: Automatic Flight Pitch Dynaflo five-element torque converter with geared converter elements; ratio 4.5:1; maximum converter ratio at stall 4.5 @ 3200 rpm.

CHASSIS: Suspension—Air-Poise air. 7.60 x 15 tubeless tires. Power steering, recirculating ball nut integral with power piston, 4.0 turns lock-to-lock, overall ratio 19.7:1, turning diameter 44.5 ft. Rear axle—conventional differential, ratio 3.23:1.

DIMENSIONS: Wheelbase 127.5 in., overall length 219.1, overall height 59.4, overall width 79.8, front tread 60.0, rear tread 61.0, rear overhang 53.5, weight with gas, oil and water 4700 lbs. (54% front, 46% rear), weight/bhp ratio 15.7:1.

Buick Century

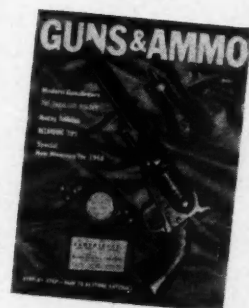
PRICE: Factory-suggested retail price of test car equipped as described, including dealer delivery-and-handling charges and federal tax but not including state and local taxes, delivery charges or freight \$4474.

ENGINE: Same as Super

TRANSMISSION: Automatic Variable Pitch Dynaflo five-element torque converter with gears; ratios: Drive 1 x converter ratio; Low 1.82 x converter ratio; maximum converter ratio at stall 3.5 @ 3100 rpm.

DIMENSIONS: Wheelbase 122.0 in., overall length 211.8, overall height 56.9, overall width 78.1, front tread 60.0, rear tread 59.0, rear overhang 52.2, weight with gas, oil and water 4560 lbs. (54% front, 46% rear), weight/bhp ratio 15.2:1.

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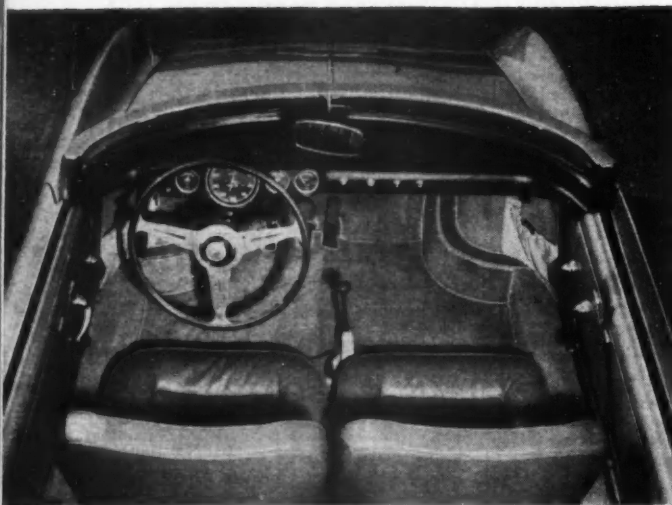
Who Says **ECONOMY CARS** Must be **STODGY?**

TO ANSWER THE QUESTION in the title, they don't have to be stodgy—especially if you take a Fiat 600, modify it to an Abarth 750, and add a Bertone body such as these. The result: a dreamy, daring, diminutive design.

What makes an Abarth out of a Fiat is most generally in the engine. In the case of the 750 Abarths, Abarth & Co. of Turin, Italy, take a Fiat 600cc four-cylinder engine, bore it

slightly, replace the crank with a counter-balanced one that allows a longer stroke and uses a lightened flywheel, install a special camshaft, raise the compression, put in lighter valves, and use headers with twin pipes. Power jumps to 40 horses at 5500 from 21.5 in the Fiat 600.

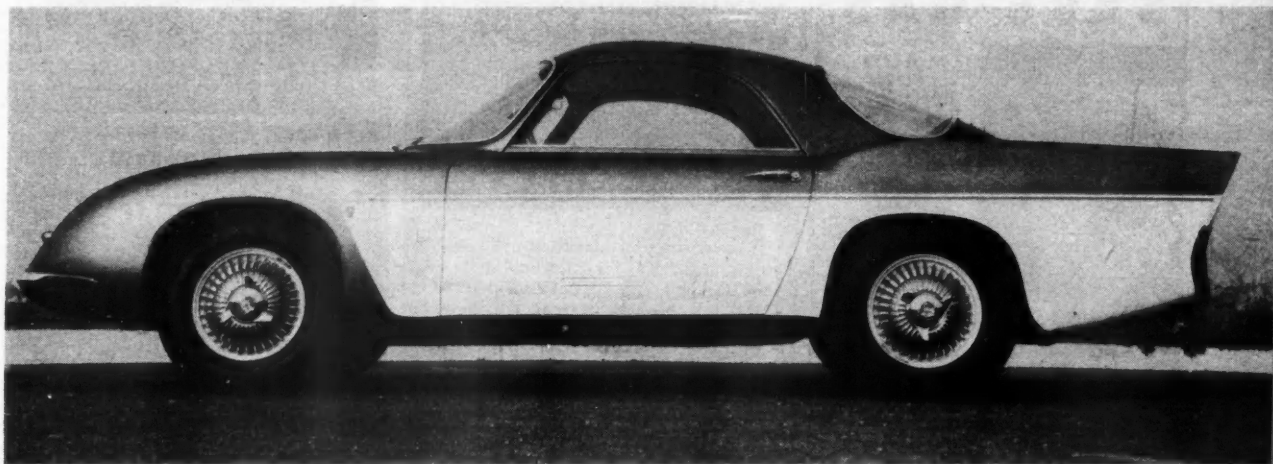
Though Bob D'Olivio and I were able to take these two cars away from the dealer at Monte Carlo Imports in Redondo



INTERIOR OF SPYDER shows separate, contoured seats, good placement of instruments, floor-mounted shift.



FIVE-FOOT-TEN author had to slouch in seat of coupe to miss rooftop. Wheel position and vision are good.



WITHOUT SOMEONE standing by these Bertone-bodied Abarths (opposite), you'd never know they're only four feet high.



Beach, Calif. for only a few hours, that was enough to impress me with one thing. No matter if they are small and you have to immediately become a defensive driver, they've got performance, will give you economy, and have that "neck-twisting" quality that all sports car owners enjoy. As to how they "wear" on you, we'll be able to tell you more about that in our July issue. Gordon Wilkins has tried two of the standard-bodied Abarths in sunny Italy, while Bob Rolofson has been driving a Zagato-bodied coupe in sunny California.

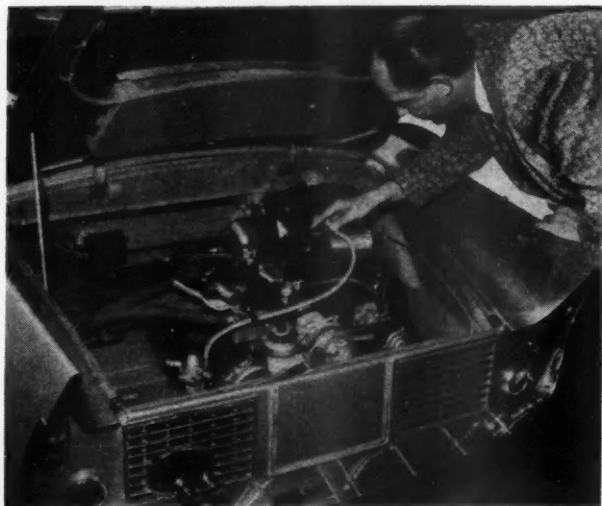
As regards these two particular Abarths, I preferred the Spyder to the coupe, mainly because my head touched the

roof in the closed car and so I had to slouch down in a quite uncomfortable position. I pushed the seat all the way back, which helped some, but my feet still rubbed the steering column as I worked the controls. My only other objection to either car was that the four-speed box was quite stiff; this I imagine you could get used to, even if it didn't loosen up. (The one we're now testing has proved this point.)

The ride is amazingly good, reminiscent of the Alfa Giulietta, and what you might call "softly choppy." It certainly isn't as buckboard-riding as many similar cars of 79-inch wheelbase.

Despite the fact that this country hasn't been able to produce a four-coil-spring car that handles at all decently, here's one that does—and it not only uses coils at all four wheels but even has the four-cylinder engine at the rear! Once you gain confidence in pushing it through the corners, instead of letting up on it and allowing the rear end to come around to meet you, you'll be hard on the tail of everything but the all-out competition jobs. It's really no wonder that Abarths have met with so much competition success in Europe—they're built for it.

/MT



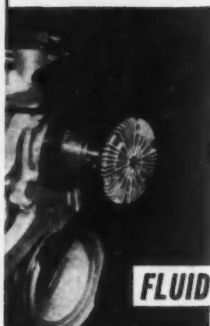
EXTREME SLOPE of rear deck forced use of side-draft Weber carb on Abarth-modified four-cylinder 750cc engine.



PHOTOS BY BOB D'OLIVO

SMOOTH HOODS of both cars were achieved by retractable headlights. Spare limits luggage space.

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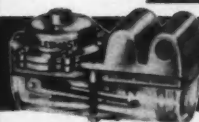
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CAR OWNER'S



LIBRARY

A new series of service handbooks has been announced by the Arco Publishing Co., 480 Lexington Ave., New York 17 (\$4). These books explain in detail the overhaul and maintenance of British cars.

The first three titles off the press are: *Austin Cars*, *Vauxhall Cars*, and *Morris Cars*. Each deals with engine overhaul, cooling, fuel and exhaust systems, clutch and gearbox, brakes, suspension, ignition and electrical equipment.

A must for vintage car fans, *The Restoration of Vintage and Thoroughbred Cars* is the latest of the Batsford Classic Car Books. This new volume describes in detail the complete overhaul and restoration of a vintage car to its original showroom condition. Written in a straightforward style and liberally sprinkled with over 70 drawings and photographs, it should satisfy both neophyte and veteran old car fans.

The appendix alone is like finding buried treasure to the vintage fan. It lists firms dealing in hard-to-find parts, bits, and services, and a list of clubs and registers specializing in vintage and classic cars. Published by B. T. Batsford, Ltd. (London), for 30 shillings (\$7.50 in U.S.).

When you drive, are you subconsciously a "clut glut," a "barker," a "waggler," a "great lover"? The *Ranald Psychoanalytical Master Chart* is designed to help you analyze your subconscious impulses and mannerisms—and those of people you meet. Thus, through self-psychoanalytic awareness you can help decrease the possibility of accidents.

This 24-page booklet sells for 25 cents, and is available from Josef Ranald, 5739½ Camerford Ave., Los Angeles 38, Calif.

CAR DESIGN CONTEST

Time is growing short to enter the MOTOR TREND Design Contest—deadline is June 1. As outlined in the official rules and regulations on page 42, Mar. '58 MT, awards will include \$500 in cash to the first prize winner; in addition, first and second prize winners may receive a car, subject to the conditions in the official rules. Due to unforeseen legal complications, Frank Thomas and the Frank Thomas Development Co. will be unable to award winners the shares of stock mentioned under "Awards" in the March MOTOR TREND. Mr. Thomas, on behalf of himself and the company, regrets that laws pertaining to issuance of stock certificates require him to revoke the offer.



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DENVER—Jake's Auto Parts Co., 775 Champa Street
LONGMONT—Charles M. Harris Auto Parts, 919-925 Main

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NEW HAVEN—Walters Automotive Distributors, "Warehouse Distributors", 161 Day Street

ILLINOIS
CHICAGO—Admiral Auto Stores, 5958 W. Addison
CHICAGO—Ray Erickson Speed Serv., 3049 W. Irving Pk. Blvd.
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CHICAGO—Warshawsky and Company, 1800 S. State St.
DANVILLE—Fagen Auto Parts, 30 South Hazel Street
DECATUR—Merry Randolph Motor Supply, 304 E. Wood Street

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DAVENPORT—Strum Auto Supply, 413-15 West Third St.

KANSAS
LAWRENCE—Pippert's Automotive Parts, 211 E. 8th Street
SALINA—Salina Spring & Axle Service, 672 So. Broadway
TOPEKA—Grogg Tire Company, 300 W. 6th Street
WICHITA—Phipps & Sons, 3036 So. Broadway

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BATON ROUGE—Marks Seat Cover Center
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LAKE CHARLES—Marks Seat Cov. Ctr., 2204 Ryan & 610 Broad
NEW ORLEANS—Late Model Auto Parts, 2045 Poydros Street

MICHIGAN
DETROIT—The Hot Rod Shop, 8249 Grand River
LINCOLN PARK—Al's Auto & Glass, 3080 Fort Street

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MINNEAPOLIS—The Big Wheel Auto Stores, 1418 E. Lake St.

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KANSAS CITY—Sterling Tire & Supply Co., 600 E. 31st St. & 3222 Truman Ave.
ST. LOUIS—County Auto Parts, 6910 Easton Avenue

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PATERNON—House-Of-Chrome, 187 Paterson Street

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ALBUQUERQUE—Ace Auto Supply, 1513 South Fourth St.

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OKLAHOMA CITY—Champion Auto Supply Company, "Warehouse Distributors", 1341-43 West Main Street

OREGON
EUGENE—Pacific Wholesalers, 44 W. 10th Avenue
PORTLAND—Coast Auto Store, 110 N. W. Broadway

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HARRISBURG—Chelsea Auto Parts, 25 N. Cameron
PHILADELPHIA—H. R. Sales Company, "Warehouse Distributors", 1204 West Girard Avenue
READING—Seward's Speed Shop, 200 Lancaster & 434 N. 6th

TEXAS
AUSTIN—House of Seat Covers & Mufflers, 10th & Lamar
CORPUS CHRISTI—Muffler Shop, 4510 Ayers & 723 N. Brownlee
DALLAS—Marks the Seat Cover King, 1800 Greenville Avenue
DENISON—Presley Auto Parts, 905 S. Crockett
FORT WORTH—Kragen Auto Supply, 5 Stores to Serve You
HOUSTON—Warren Auto Supply, 5721 Humble Road
PLAINVIEW—Reed Wrecking Co., 407 Columbia Street

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BELLINGHAM—Gordon's Auto Parts, 925 State Street
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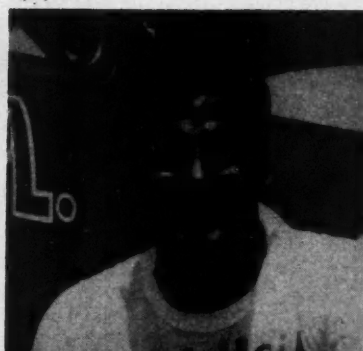
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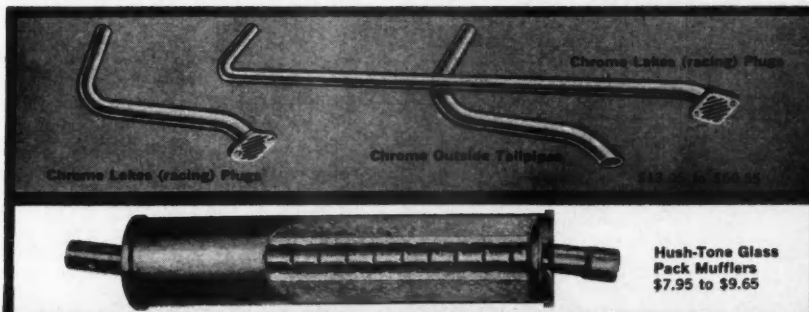
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"I DROVE THE MONTE CARLO RALLY"

By Gordon Wilkins



ONLY BRITISH CAR to reach Monte Carlo without penalty points was Sunbeam Rapier driven by Harper and Elbra.

THE 1958 MONTE CARLO RALLY will add more to the folklore of this event than half a dozen less difficult years. When Sydney Allard, former winner, slid off the road for the second time almost within sight of the finish, his brother Tom, the imperturbable, who was busy with maps and stopwatches, simply asked, "Where are we going this time, Sydney?" He said to me afterwards, "It gets very cold when the car is travelling along on its side, because it shovels the snow in right through the windows."

And Louis Chiron, veteran French racing driver, commented on that frightful first night when the Paris starters were obliterated between Gerardmer and St. Claude, "I could barely hold the car at 35 miles an hour. Snowflakes as big as tennis balls were streaming straight at my eyes until I was almost blind. But an Englishman went past covering us with snow at 50 mph. I thought, 'How can he do it? The English are very scientific. Maybe he has radar. But that wouldn't help. Look what it did for the Andrea Doria.' And a few kilometers later we saw him. Somehow his car had climbed up the rock face onto a shelf above the road, and seemed to be ready to fall over backwards."

The adventures of Les Leston and myself with the Riley 1.5-liter began soon after the late arrival of the Channel Ferry at Boulogne. Despite the snow and ice in Scotland and England, we had always kept time in hand and were staggered by the enthusiasm of the spectators who gathered in snowstorms out on windswept moorlands to watch the cars go by. I remember a small boy kneeling in blinding snow, in the early evening, shining a torch to try to read the numbers of the cars as we went

past, and an old man of about 70 standing in deep snow waving a hurricane lamp. In the towns they were jammed four-deep to watch. Such is the power of publicity, for the event is now covered by press, radio and television as one of the major events of the year.

A short distance past Boulogne two hills were partly blocked by novices who had tried to climb too slowly, slid broadside on the sheet ice, and were fitting chains, the ultimate policy of despair.

At the road junction at Blangy, farther south, there was chaos as cars slithered about in foot-deep snow in the yellow glare of foglamps. Those behind cried "Forward!" and those in front cried "Back!" as wild rumors filtered through that the road was blocked. I believe in seeing for myself, so we struggled through cars which were bogged down in the soft snow. The road was indeed half blocked by two trucks which had slid broadside into the hedge on a hill, but we got through and had four minutes in hand at Mantes after battling blind through the snow curtains thrown up by slower cars.

THINGS WERE EASIER after that until the middle of the day, when the hot sun began lubricating the surface of the crisp white snow of the run from Bourges via Montlucon to Mauriac. At a sharp right and left turn under a railway bridge a Zephyr driver hesitated a fraction too long and slid head-first into the ditch. Raymond Baxter, B.B.C. reporter, took his Aston-Martin smartly up the escape road, and we nipped through with the Riley. A few miles farther on, Anne Hall's Ford Zephyr with her co-driver at the wheel suddenly spun on the straight, in front of us,

careened down the road backwards, struck a kilometer post and toppled on its side. We helped them out through the windows and pressed on in pursuit of Yardley and Oddy in a Rapier, who were trailing a dazzling wake of sunlit snow.

The beaten track was only single-car width, and we lacked the power to tear past through the deep snow on the verges, so there we sat, until a truck suddenly came swinging around a blind bend and slammed into them head-on. The front of the Rapier was crumpled like a paper bag and the truck was slewed broadside, blocking the whole road. Cars piled up behind us, and a doctor from a Jaguar gave first aid to the cut heads of the Rapier crew. The truck driver was staggering about unhurt, but incoherent; so I steered the front end while the rest manhandled it out of the way; at least snow and ice make it easier to shift tons of dead weight.

In minutes we were away again, making up time on the treacherous wet snow, but now we were wearing safety belts and crash helmets. And there was time to slop some fuel into the main tank before checking out at Mauriac.

HOURS OF TAP DANCING on brake and accelerator, hours of wheel twitching which sets neck and shoulder muscles aching, took us through Vichy, Villefranche, Bourg and Dole, to the dreaded Champagnole-St. Laurent-St. Claude sector through the mountains of the Jura, which had wiped out the Paris and Munich contingents the night before. I was resting my eyes—sleep was no longer possible—when the car slid wide on a treacherous right-hand bend above a ravine. There was no great shock—snow is a wonderful

shock absorber—but a wheel was bucked against the retaining wall and our front suspension was bent. That might have been patched up, but a cloud of steam in the glare of the headlamps announced a punctured radiator and soon a black trickle of oil showed that the sump too was holed.

Madly we pushed to get the car clear of the corner before the next car arrived, and as we did so a Ford Anglia spun, hit the wall, slid back across the road and bounced into the rock face, to continue downhill with buckled fenders. Moments later Gerry Burgess' Zephyr rode right up onto the wall, tumbled back, bouncing wildly and was rammed broadside by a Triumph TR-3. The Ford continued on down the valley so fast that we thought his brakes had failed. The Triumph's front was in ruins, so this car too was man-handled away with steam rising from a split radiator and smoke rising from a short-circuiting lamp wire. It was then between three and four in the morning. Snow was falling and it was freezing hard.

We collected a few belongings, shoveled snow over the oil, got the car out of harm's way as far as we could on the narrow road, and trudged down the mountain past Shanley's Austin A-105, which had hit the rocks head-on farther down, while behind us car after car slammed into the retaining wall on the corner where our rally had ended. We did not know it then, but 120 feet below us was Ronald Faulkner's Jaguar, held precariously by a few bushes near the edge of a sheer 150-foot drop into the river. He had arrived earlier, when the fresh snow formed a ramp onto the top of the wall, and sailed straight over into the blackness, to plunge headlong down the mountain. He calmly switched off the ignition, and said to the crew, "Sorry, chaps, we've had Monte Carlo." They crawled out, groped their way on hands and knees up the steep slope, and were almost knocked back again when a Triumph crashed into the wall just as they put their heads over it.

DOWN ON THE OUTSKIRTS of St. Claude, the level crossing over the little single-line railway was in ruins. A gate was telescoped and a warning lamp lay in the ditch shining forlornly skywards. A Simca had slid into the gate and was immediately rammed by Leslie Griffiths' MG. The MG crew were running close to the time limit. All the way down the mountain Griffiths' son, on his first Monte Carlo Rally, had been warned that when the car stopped he must pay no attention to anyone or anything, but get into the control and get the book stamped. When they crashed, the lad didn't hesitate; he was out like a jack rabbit, hammering on the door of the crossing keeper's cottage, demanding that they stamp his road book. By the time he realized they had crashed, an Alfa Giulietta had broadsided behind them and all hands were busy pushing. The first car through the jam reported to the control,

continued

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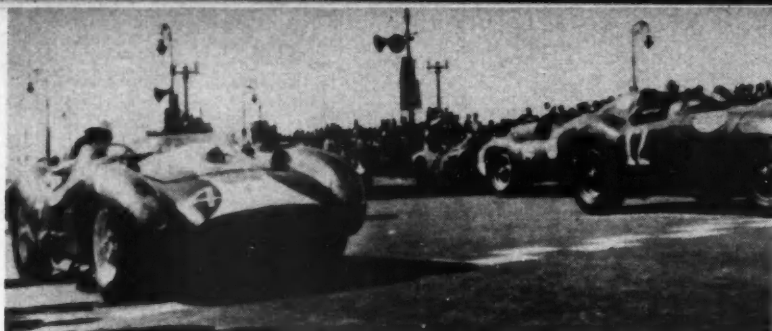
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WIDE WORLD

STIRLING MOSS in 4.5 Ferarri (4) on starting grid in Gran Premio de Cuba, February 24. Race was marred by accident when Cuba's Armando Cifuentes skidded on oil slick and flipped into crowd, killing five, injuring 40. Cifuentes escaped with slight injuries. Bizarre note was pre-race kidnapping of J. M. Fangio. Moss was declared winner, race halted in lap 5.

MOTOR SPORTS

continued

who sent a commissaire up to investigate. He arrived just in time to be hit head-on by a Mercedes which was travelling downhill backwards.

The village street was lined with crumpled cars for the second night running and the breakdown gang from the local garage, dead tired, was methodically commuting up and down the mountain in an ancient Talbot with chain-shod tires, hauling the casualties. By 6 A.M. they were all in, except Faulkner's Jaguar, which was hauled up later by a timber winch, undamaged and almost unmarked. Local garage proprietors, seeing enough repair work to keep them going until spring, were offering to write us when our cars were ready, but the impatient, resourceful creature the French call the Rallyman, does not abandon his car except in the direst cases. Tired crews

set to work then and there tearing damaged cars to bits. Local mechanics were kept busy heating, bashing, and welding damaged parts all through Friday and Saturday. By Saturday night all but three of the dozens of crashed cars had departed. The weather was turning milder and the Rally of 1958 was becoming a memory.

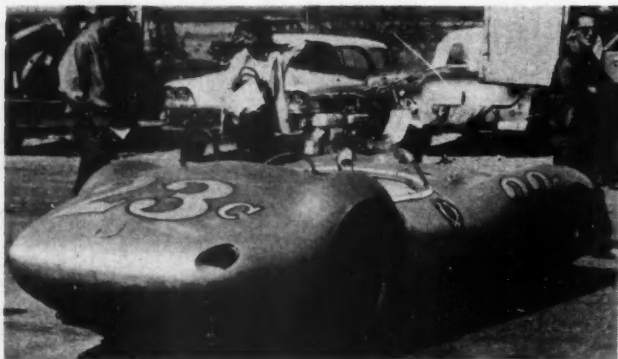
At presstime Tony Vandervell had not yet signed any drivers for the Vanwall team and had not even announced whether he was going to race again or not. Work is still being done on the conversion of the engines from alcohol to petrol. Tony Brooks tested a Vanwall with petrol at Silverstone and got within one-tenth of a second of the best time recorded on alcohol fuel last year.

No great changes are planned on the chassis, except perhaps improvements of the de Dion axle layout. Body design

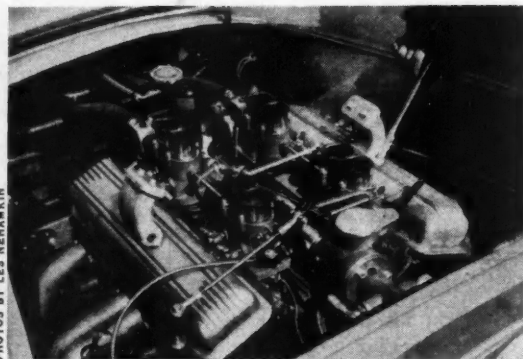
is, however, being given considerable attention and wind tunnel tests are to be carried out on the streamlined body tried at Reims last year and hastily discarded.

The *Autocar* is again running the Championship for British Formula II drivers in 1958, to give those who might be potential top-flight pilots a chance. Formula I racing is so expensive and these men seldom get a chance to drive Grand Prix cars. By being offered some encouragement it is hoped that they may prove themselves suitable to break into Formula I racing.

The first Formula I Aston-Martin single-seater has been completed and tested at Silverstone. Several mechanical features follow closely those of the DBR-1 sports racing car which won the 1000-km race at Nurburgring last year. It has a tubular space frame with wishbone front



PROTOTYPE of All-American competition sports car has been built and tested by Reventlow Automobiles, Inc. Car proved very manageable, has unofficially bettered track records. Engine is much modified '57 Chev with



PHOTOS BY LES NEHAMKIN

Hilborn fuel injection. Halibrand quick-change rear end is used in conjunction with de Dion tube and Watts linkage. Chrome moly tube space frame weighs only 127 pounds. Total dry car weight is less than 1750 pounds.



suspension and de Dion rear axle with coil springs. The engine is the six-cylinder twin overhead camshaft unit used in the DBR-1 sports car; it has been bench-tested both with carburetors and fuel injection. Transmission is through a five-speed gearbox mounted at the rear in unit with the differential.

BMC cars have won first place and several other prizes in the Mobilgas Economy Run in Australia, first 1958 event of the series, against competition from French, Italian, German, American and Australian cars. A Wolseley 6/90 driven by Eric Lane and S. Pomroy won first prize in the General Classification averaging 34 mpg on the tough 1224-mile course. They also won the over 2500cc class.

Stirling Moss has been awarded the Segrave Trophy for 1957 "for his outstanding performances with a Vanwall car in winning last year the British Grand Prix (designated Grand Prix of Europe), the Italian Grand Prix and the Grand Prix of Pescara, as well as establishing new International Class F (1500cc) records at Utah U.S.A., last August."

Rootes Motors Inc., makers of Hillman and Sunbeam cars, have announced their Auto Rally-Tour of Europe, leaving New York by British Overseas Airways May 10th. The four-week tour will include nine countries, with a choice of routes.

Costs for the complete round-trip tour by air from New York start at \$888 per person; travel by sea can also be arranged.

Ferrari is preparing an agreement—not yet signed—with Bugatti for production of a Bugatti-Ferrari Gran Turismo car, called the "Bugatti-license Ferrari," with 1600cc engine. This car could become stiff competition for the Porsche Carrera. A prototype has already been built, and two engines are under construction for it. One is a development of the 250-GT's V-12—they took one-half of the three-liter engine and increased the cylinder capacity via a longer stroke to 1600cc. The second is a four-cylinder developed from the V6 Formula I engine, with two cylinders removed. Power output of the new engines will be in the neighborhood of 150 to 160 hp.

Ferrari is also holding talks with Rootes, in case Bugatti does not undertake the project. Since Ferrari himself will not build an engine under three liters, he is seeking cooperation from other firms for building a 1600cc car.

For Le Mans Ferrari is preparing a new car with lighter chassis and a 12-cylinder experimental engine with four overhead camshafts. One engine version was made by joining two V6 Formula II engines. All 1958 Ferrari racing cars will be powered by V-12 engines. At Le Mans Ferrari will also enter a works 250-GT.

Driving non-stop for seven days, an ordinary Fiat 500 with engine conversion by Abarth has broken six international records at Monza. The new 500, introduced last year, covered 11,294 miles at an average speed of 67.27 mph, gas consumption of 55.4 mpg.

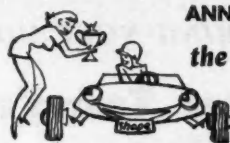
The fate of the Mille Miglia is still unknown. Regulations are not yet out for the revised version of this event, even though the F.I.A. has announced a date of May 11th for under-1500cc sedans. Now veteran organizer of the Targa Florio, Vincenzo Florio, wants his Targa to be run on the date fixed for the Mille Miglia and has applied to have it recognized for the Sports Car Championship. To add oil on troubled waters Count Aymo Maggi and Giovanni Canestrini, members of the organizing committee, are said to have resigned in protest against a tame "rally" version of the 'round-Italy road race.

Intent on stopping all road racing in Italy, the Italian government has caused the Naples Grand Prix to be cancelled. But the drive to stop racing in Italy does not seem to apply to Sicily, where the Targa Florio is a proper race of 6620 miles on public roads closed for the purpose. So it seems a little odd that while the Mille Miglia is forbidden the Targa goes merrily on as it has since it was first run in 1906.

The Russians declined to attend the first international motor race meeting at Goodwood on Easter Monday. Replying to the British Automobile Racing Club, G. Cherkassky of the U.S.S.R. Automobile Section wrote, "We sincerely thank you for your kind invitation for our sportsmen to take part . . . but, unfortunately, we do not have an opportunity to accept as they will be taking part in other sporting events." It seems that at the moment the Russians do not intend to "invade" motor racing.

COMING EVENTS

PREPARATIONS for the flood of events in May keep things quiet on the racing front during April . . . Some activity for sprints and midgets on local basis . . . Biggest U.S. sports car event Palm Springs, April 11th . . . Mobilgas Economy Run to Galveston, Tex. on 13th. May in Europe sees the Monaco Grand Prix, 18th; Dutch Grand Prix, 26th . . . U.S. sports car meets include Hawaii, May 9-11, and Cumberland, Maryland, 16-18; Cumberland draws large crowd—over 65,000 last year . . . End of May brings five 500-milers: Indy; NASCAR stocks, Trenton, N.J.; CRA sprints, Riverside, Calif.—all on May 30th . . . URA midgets will run May 31st and NASCAR stocks June 1st at Riverside—both are 500's.



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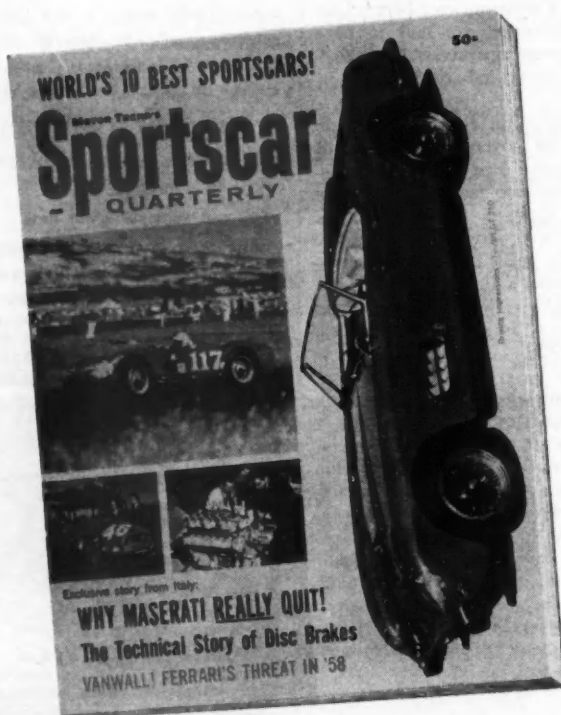
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How to **DOUBLE** Your Car's Life

Adding years to its usefulness is simply a matter of understanding—and meeting—its maintenance requirements

by Peter Quigley

WHETHER YOUR CAR is new or old, there are certain things which can be done to improve its performance and appearance—and to add years to its life. You can do most of these yourself, or have your favorite mechanic do them. The important point is to be alert at all times for the numerous ways in which you can protect your investment. Train yourself to observe and note symptoms of developing defects before they cause costly trouble.

If you are lucky enough to take delivery of a new car, the first thing you will have to get used to is that the car is not new. There are already signs and symptoms of deterioration on a car that rolled off the assembly line only three weeks ago. The finish of many components, once preserved by a protective film of oil, has now oxidized to some degree in the humid atmosphere of Michigan. How does this affect engines of new cars?

NEW CAR ENGINES

Protected from outside humidity and salt spray and covered with a film of oil, the engine interior should be completely free from any kind of corrosion. Unfortunately, this is not the case. Rust formation in new engines is not uncommon because of water condensation due to rapid cooling of the engine casting whenever it stops running. Light areas of rust are more prevalent in engines of new cars that have been standing around for long periods than in old cars in constant use.

This type of corrosion is, of course, delayed by the presence of oil and is usually so slight as to hardly affect working tolerances between moving parts. Precision fits such as lifter bores and valve guides, which are particularly tight on new engines, may cause trouble.

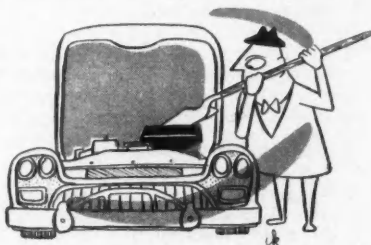
The factory recommendation to add a "cylinder lubricant" to your first few tankfuls of gas should be taken seriously. The penetrating effect of the diluted "lubricant" is usually sufficient to free any

potential sticking of valves or lifters due to rust. Once free, these parts will conform perfectly.

OIL FILTERS

An oil filter's main advantage is that you can drive an extra thousand or two miles between oil changes. You must remember to renew (or clean) the filter element at 10,000-mile intervals at least—more frequently, if your driving is in a dusty region.

If your engine is not equipped with an oil filter, you can get as many miles as your neighbor who has one, if you change oil regularly at the correct mileage intervals. For proof of oil-filterless durability,



look at the Volkswagen or innumerable Detroit-manufactured business coupes with standard (no oil filter) equipment.

OIL FLUSHING

Due, no doubt, to the modern trend to make money faster, service stations today seldom offer an oil flush as part of the lubrication and oil change routine. In bygone days, no self-respecting lube man would dare pour fresh oil into an unflushed engine. The flush was a mixture, usually one part of kerosene to one-and-a-half or two parts of oil (low grade). It was poured in after draining away the old oil and the engine was then run for a period of about five minutes at a fast idle. The flush oil was then drained and a good 10-minute drip-dry period was allowed while your lube man greased the chassis lubrication points. Better stations still offer this service today, which

should be done at least once every 10,000 miles—this fits in nicely with oil filter element replacement. Oil flushing should never be done with the filter element in position. The flushing action might dislodge large chunks of sludge that are better off in the filter.

AIR CLEANERS

Internal engine filth, for the most part, comes from outside the engine, from the air which the engine breathes through the carburetor. That is why the most important filter on your engine is the air cleaner. No automobile manufacturer today markets a car without an air cleaner. Yet air cleaners receive little or no attention on most cars. It is likely that a nation-wide check on air cleaners would prove that the majority of them are now ineffective due to lack of maintenance.

Once an air cleaner gets really dirty, it starts to act as an overflow dam, feeding a steady overflow of dirt into the engine's induction system. It ceases to be a filter. Properly cleaned and maintained, an air cleaner is better than 90 per cent effective in protecting an engine from abrasive wear and oil contamination. But at best, its filtering efficiency is a temporary one and the dirt, consisting of everything that can be found in the air we breathe, will eventually find its way past the element, or it will clog the element, forcing contaminated air to enter the unrestricted passage provided for such an eventuality. Wire-mesh elements seldom clog, but here the same thing happens in a different way. The dirt works through the wire mesh which is under constant induction pressure while the engine is running.

Cleaning air cleaners is simple. The wire-mesh type is rinsed in clean gasoline and then allowed to drip-dry for 10 minutes or more. The oil in the container is then rinsed out and replaced with fresh oil. The new paper-element type found on 1958 models requires only a few shakes and taps to dislodge the dirt.

continued

A light blow-out with an air hose afterwards makes it ready for use again.

OIL CONTAMINATION

Oil seldom, if ever, breaks down through use in an engine. But oil contamination through formation of acids will destroy its lubricating qualities. This will cause scoring of cylinder walls or rapid wear of piston rings. The most damage is done to white metal bearings, which, after exposure to crankcase acid, begin to look like telescopic photographs of the moon, covered with pits and pockmarks. With contaminated oil in the pan, your engine becomes the object of a two-pronged attack, abrasion and corrosion. Corrosion is a non-stop process which goes on day and night.

Owners of imported cars with two-cycle engines using oil/gasoline lubrication enjoy a clear advantage in this respect. The inside of a two-cycle engine, even after 100,000 miles of operation, remains spotlessly clean.

The formation of rust in two-cycle engines, however, has much more serious consequences since most of these engines are equipped with roller-bearing crankshafts, roller-bearing connecting rod ends and needle-bearing wristpins. Any type of rust corrosion on these bearing surfaces may have fatal results. On the other hand, your two-cycle engine will never require an oil change or an oil filter element change.

TESTING PERFORMANCE

An observant owner-driver with basic know-how can save a mint of money by testing and noting his car's road performance. Bearing in mind that ignition, induction and carburetor maladjustments can result in multiple defects, the car's performance should be checked periodically with a yardstick of known good performance. Take, for example, a known gradient which can be topped at 55 mph from a standing start. Here you have a homemade and very realistic dynamometer test which will reveal more about your engine (and your automatic transmission) than a thousand guesses. In flat country, a good substitute for a gradient is a measured distance and timed acceleration test.

Listen for valve or any other kind of clatter. To pinpoint the source of noise, use a long screw driver as a stethoscope, the insulated handle against your ear and the tip against the water-pump housing, power steering pump, air compressor, and generator in turn. This type of probing must be done with the engine running.

Other noises to listen for while you drive are "pinging" under load, back-firing on the overrun (no load), and knock under no-load conditions. If it's a question of power loss, you can make sure whether it occurs during acceleration only or over the whole speed range. Keeping a constant check of your gas mileage will

also give you a check on your car's performance.

Always summarize your maintenance observations, writing them down if necessary. The **FIRST SIGNS** table shown here is a fair guide for this type of trouble-shooting. Your service mechanic will appreciate your efforts because, like a doctor, he prefers to have a case history on the patient before making any diagnosis.

CHASSIS MAINTENANCE

Chassis maintenance is relatively simple and highly beneficial. It is wise to check periodically such components as tires, wheels, bushings, shackles, steering arms, exhaust pipes, mufflers, brake lines, shock absorbers, roll bars, fuel lines, springs and emergency brake cables. The hoist in your local service station is the best place for it.

On the hoist, the average chassis frame and components look like an untidy pile of corroded junk. The appearance is often misleading. The frame, the wheel locations and the front end steering geometry constitute one of the greatest precision factors in automobile construction. For

this reason, many aspects of chassis maintenance require **qualified** checking at regular intervals.

FRONT END ALIGNMENT

The underpinnings of domestic cars are still highly vulnerable to misalignment from curb scuffing or even the occasional chuckhole taken at speed. This unfortunate, weak-kneed condition is attributed to increased road impact all around due to higher horsepower and many more pounds of weight. Foremost condition and consideration in front end alignment is safety. After that comes the pocketbook. A misaligned front end can devour copious quantities of rubber.

Whenever your suspicions about poor steering lead you to think of misalignment, have the tire pressures checked before jumping to any conclusions. Though you can check the front end alignment on your car yourself (see Feb. '58 MT), an alignment machine is the best guide to accurate and easy adjustment. Alignment machines, or a front end alignment jig specially designed for your make of car, use stable measuring points on the wheel rim or steering spindle

FIRST SIGNS OF TROUBLE

Symptoms	Defects	Likely Results
Power loss, pinging under load. Deceptively smooth under no load.	Ignition too far advanced.	Pounding wear on connecting rod and crankshaft bearings. Fracture of one or more piston crowns, if prolonged.
Audible clatter from valves at all speeds. Poor low, though normal high-speed performance.	Excessive valve lash.	Burning of exhaust valves at stem curvature to discs with ultimate sticking of valves or occasional disintegration. Loss of compression.
Silent valve operation. Good low-speed but poor high-speed performance.	Insufficient valve lash.	Burning of both exhaust and intake valves at disc periphery. Loss of compression.
"Dying out" effect after good initial low-speed torque. Poor gas mileage. Power loss under load. Inability to maintain correct operating temperature.	Fuel/air mixture too rich; i.e., too much fuel.	Fouled spark plugs. Oil dilution, cylinder wall and ring wear due to washout effect of unburned gasoline. Accelerated wear due to low temperature operation of engine. Starting failures.
Excessively high engine temperatures and power losses at all speeds and loads. (Rough idle on most imported makes.)	Fuel/air mixture too lean; i.e., not enough fuel.	Burning of valve discs and piston crowns. Cracking and warping of cylinder heads and combustion chambers. Seizure or scoring due to overheating.
Poor starting. Missing at high speeds. Poor gas mileage.	Defective plugs, rotor tips, high tension cables, distributor caps or excessive distributor shaft play.	Unbalanced running of the engine, torsional stress on crankshaft (breakage) and bearings (ovalness) if prolonged. Especially severe on new high-compression engines and imported pancake engines.



from which to evaluate and measure caster, camber and toe-in. With such tools it is also possible to check the overall alignment of all four wheels with one another, a setting which may have been affected by an earlier collision.

CHASSIS LUBRICATION

Lubrication follows simple rules: The lubricant should be clean, the grease fittings should be wiped before applying the grease gun, no grease fitting should be by-passed, faulty grease fittings should be replaced without delay, two or three shots of grease are sufficient for any fitting, and all excess old grease should be wiped away. Most chassis greases are water resistant. More than one claim "hammer resistance." Whether or not these lubricants are as good at lubricating as they are at resisting hammer blows is a moot question.

Depending on the make of car there may be anywhere from eight to 26 grease fittings on the front end alone. The rear end of most cars is remarkably free from grease fittings. (The little 2-CV Citroën has a total of four grease fittings.)

THE UNDERPAN

Floorpans and fender wells can be protected by undercoating. The greatest protective advantage of undercoating is against flying stones and gravel, which have a machine-gun effect on thin automobile sheet metal. Undercoating, however, is useless when sprayed onto a dirty or already corroded surface. For this reason, it is worthwhile to pay an extra \$10 or \$20 to get the unpainted surfaces sandblasted or steam-cleaned first.

TIRE CARE

An unabated, though quiet, war has gone on between tire and car manufacturers over the subject of tire pressures. The car manufacturer's recommended pressures are always below that of the tire manufacturer. It is wise to compromise and use a tire pressure somewhere between the one in the owner manual and the one on the service station tire specification chart. The reason for the difference is simple enough: one party wants to protect the tire, the other the car. Both have good reasons for their pressure recommendations.

The types and causes of tire wear are many. The most common is low-pressure

wear, the edges of the tread and part of the sidewalls being worn or rounded off. A defective shock absorber can cause a cupping effect. Eccentric brake drums will cause spot wear (but this can also be the result of very hard braking on only one occasion over a sufficiently high-friction road surface). One of the obvious disadvantages of over-inflation is cord damage. The supporting walls of over-inflated tires are highly vulnerable to any kind of road impact, from small stones to nasty chuckholes, and the resulting damage is the kind that cannot be fixed.

TIRE ROTATION

The conventional method of tire rotation is under a storm of criticism by fleet owners and owners of more than one car having the same tire dimensions. Taxi fleet operators, for instance, ignore the spare tire in rotation and merely switch front to rear and vice versa. Spares are usually "baldies," good enough to get a driver around for a day or so. If you are in the fleet or two-car category you may find it profitable to spare your spare in this way.

WHEEL BALANCE

Wheel unbalance can be static or dynamic. Static means side wobble; dynamic means vertical tramp. Side wobble plays havoc with front ball joints, spindle bushings, steering arm bushings, rear axle oil seals and, transmitted through the pitman arm, it can ruin an otherwise perfectly good steering worm.

Vertical tramp, which acts just as it sounds, is a shock absorber killer and a body rattle inducer second to none. Balancing weights, properly applied, can eliminate both types of unbalance. But when the total of weights on any one wheel exceeds six ounces, it is time you thought of a new tire or even a new wheel. Your wheel-balancing expert will let you know and it will pay you to take his advice.

EXTERIOR

The successful spit-and-polish man will confirm for you that maintaining a new-car appearance is hard work. If this makes you conveniently forget it, however, there are plenty of "easy" liquid waxes on the market and even easier removers. One word of advice on applying remover is never to rub it too much or to power-buff it. To avoid wasted effort over large expanses of perfectly good paint, test applying the remover over the exposed areas only. Frequently paint-oxidizing is limited to the horizontal areas of the car like fender tops, roof, rear deck and hood. Apply the remover evenly and lightly over the whole surface to be cleaned.

When it comes to waxing, bring the car into the shade and wax the hood last of all, giving it plenty of time to cool

down from engine warmth. The starting point for waxing and polishing is the same as for washing, the center of the roof, working outwards and down. Never apply polish to a dirty surface even if the instructions say it is all right.

INTERIOR

The mysterious patterns of stain which show up on the headliner are easily removed by one or two applications of a sudsy detergent. Even traces of mildew can be removed by adding a dye to the cleaned surfaces while still wet. These are neutral dyes and match perfectly with gray, green, blue or brown roof trims of varying shades. The application of dye, however, must be done over the whole surface and not at any particular spot. In using any of these cleansers it is wise not to rub, but rather to be patient and apply twice or three times if necessary. You can easily end up with "clean stains" instead of the dirt stains which were there when you started.

The headliner will definitely not take any rubbing whatsoever unless you are willing to tolerate unsightly sags. Whatever brand of cleanser you use allow more than the recommended time for dirt loosening. This is important as too early removal will interrupt the loosening process. Before brushing out the nap of the cloth wait until it is perfectly dry. The final brushing, done in straight clean sweeps not only restores the even fluffiness of the nap but it also dislodges the dirt you set out to remove. A final dusting of the interior puts you in business. Your car should look as good as new and you will have gone a long way toward doubling its useful life.

CHROME

A final word on chrome for the unhappy Mid-Westerners who have all the humidity of the East plus the additional corrosive effects of salted winter roads. There is very little that can be done to guarantee you a permanently corrosion-resistant chrome finish. Detroit chrome, with the exception of Rolls-Royce and Lagonda, is about the best in existence today. It is one thing Detroit may still be proud of anywhere in the world.

The clear chrome lacquers and varnishes are well known as a good means of protection. An old service station washman once showed us another effective method, a DDT pump gun (domestic type) filled with vegetable base oil. After washing and drying bumper chrome, he carefully sprayed the surface with the gun, a small one with a fine nozzle. A window glass cleaner bottle with plunger-type spray head would do just as well, he said. How often? Try it once a week.

By following these suggestions—and practicing the sound rules of preventive maintenance—you can add years to the life of your new car . . . or take years off the age of your old one. /MT

Questions from readers

Q. OIL-COOLIC WARD. I own nine classics, every one of which uses excessive oil. Nine ring jobs are more than I can afford. Will the use of heavier oil harm engines? Fred Thorpe, Riverside, Calif.

A. The answer to your question could easily take eight or 10 pages. What do you mean by "excessive" consumption? One or two quarts per thousand was standard consumption for many classics. Three or four quarts per thousand is considered acceptable. Unless you are using your cars a great deal of the time it is generally cheaper to purchase oil than to ring or possibly bore an engine.

We do not know what you mean by heavier oil. For certain cars 40 or 50 weight oil would be maximum viscosity, while a few classics will stand 60 weight oil. Without knowing which cars you have in mind we cannot be more specific.

Oil consumption does not always result from a poor union between ring and cylinders. Many times a cure can be effected at nominal cost by locating the true cause of the consumption. Oil can disappear rapidly if: a) there is a ruptured diaphragm in the fuel pump windshield wiper unit; b) a head gasket is leaking from an oil passage to a cylinder; c) valve guides are worn or valve seats are worn; d) the crankcase ventilating system is defective; e) supercharger seals are defective.

Q. WATER WEIGHT. What is the weight of one gallon of water, and how can I find the horsepower-to-weight ratio of my car? Bob Flintcher, Chicago.

A. Water weighs 8.336 pounds per gallon. Divide the total weight of the car by the horsepower to determine pounds per hp.

Q. CARBURETOR PARTS. Where can I obtain replacement parts for a 1936 Pierce-Arrow carburetor? Fred Millard, Seattle, Wash.

A. Offhand we can't advise you of any jobber who stocks these. Parts as well as carburetors can often be interchanged among classic Packards, Lincolns, Cadillacs, Chryslers and Pierce-Arrows.

Q. ONLY NORMAL. I own a '57 Ford V8 with 57,000 miles on it. The engine is beginning to use oil, and I notice an increasing amount of vapor rising from the oil filter cap. What causes this oil consumption, and is the vapor related to the trouble? A. C. Schinly, Miami Beach, Fla.

A. Your oil-burning problems are normal after 57,000 miles. Worn pistons, rings and cylinder walls are building up crankcase pressure by allowing the compression to escape from the combustion chamber to the lower end of the engine. Since this pressure must get out someplace, it exits through the oil filler pipe. To cure this and the oil burning trouble you will have to install new rings and quite possibly rebore the cylinder walls.

Q. CHRYSLER REPLACEMENTS. Where can I find original replacement points, condenser and coil for a 1932 Chrysler? Tom McHenry, Richmond, Va.

A. You should replace these parts with modern parts and not seek original equipment. Coils and condensers that have been on dealers' shelves for 20 or 25 years have been known to deteriorate even though not in use. One of the major reasons is that the insulating wax hardens, becomes brittle and breaks away, permitting shorts. In coils the same result has been noted on the wire insulation.

Q. UNDERCOATING. I am buying a new '58 Ford and wonder about the advisability of undercoating. Do you recommend it? Nate Mann, Pittsburgh, Pa.

A. We most certainly do. It not only controls rust but it adds to comfort by its sound-deadening qualities. We suggest only a quality job, however.

Q. WATERPROOFING. Can you recommend a good top dressing for use on a classic sedan? Every time it rains the interior becomes water-soaked. Marv Karne, Oak View, Calif.

A. Don't mess around with top dressings. At best they are temporary repairs and rarely look good. Take the car to an upholsterer and have the top replaced. Water-soaked upholstery can lead to wood rot, mildew, rust and total loss of a good car.

Q. MORE POWER. I own a '51 Chevy coupe and want to install more power. Could I fit a '57 Chevy V8 under the hood? What would this do to the front-to-rear weight ratio? Jay Blakesley, Toledo, Ohio.

A. The '57 Chevy will go in with the usual problems associated with engine swaps. We suggest you use the '57 stick shift and a resistor for your lights and instruments to maintain six volts in this department and still allow the stock 12 volts for the engine. We doubt if you will notice any change in front-to-rear weight ratio.

Q. THREAD PROBLEM. My radiator water cap (Lincoln V8) is cross-threaded. The threads in the radiator shell are also cross-threaded. I have been unable to find replacements, so what do I do? Fred R. Hannegan, Santa Ana, Calif.

A. Most manufacturers of luxury cars built the radiator shells out of harder

metal than the radiator. If our memory serves us right the cap on your car is made of brass. Lacking replacement parts, a machine shop seems to be your only answer.

In most cases the cap threads become worn out but the threads in the shell do not. In this type of car an expensive solution is to press a collar into the cap and rethread the collar. A collar could be pressed into the shell and it too could be rethreaded. In either of these events, some machinist is going to make a mortgage payment with your money.

Q. BURNING QUESTION. During a drag race I burned a hole in the No. 4 piston on my '57 Corvette. Compression is 10 to 1, and I use 98-octane gasoline with a 1/4-race cam and four single-barrel carburetors. I also noticed the center electrode was burned completely off the No. 4 spark plug. I suspect a lean mixture but with four carbs supplying gasoline, that seems rather remote. What do you think the trouble is? Wayne Chalmers, Indianapolis, Ind.

A. Lean mixture. Your trouble is not uncommon. Four carburetors won't supply any more gasoline than the capacity of the fuel pump. At top rpm the engine is being fuel-starved. Install a good electric pump and a regulator. This extra fuel boost will assure enough gasoline at all times.

Q. AIR CONDITIONING. I own a 1955 Plymouth which I would like to air condition. Can I buy such a unit for this car? George State, Atlanta, Ga.

A. Yes—several makes are available. Two of these are distributed by Western Auto Supply and Sears Roebuck.

Q. TRUCK GEARS. Can I buy a 4.5 to 1 gear ratio for my '52 Ford with overdrive? Will the gears from Ford's light truck line fit? Allen Findley, Mobile, Ala.

A. Yes—the Ford truck gears will fit and give you 4.51 to 1 ratio.

Q. MILLING HEADS. How much can I mill off the heads of my '54 Mercury? King Mott, Atlanta, Ga.

A. .040-inch should be maximum.

Q. HISTORICAL DATA. In what year did fluid drive become available on Chrysler products? John Fuhr, Santa Monica, Calif.

A. Production cars were equipped with fluid drive in 1940, although experiments were made with some models in 1938. The concept of fluid drive was known long before '38. Experiments with it took place as early as 1914.

It is impossible to answer any letters personally; we will answer the most interesting and most frequently asked questions in this column.

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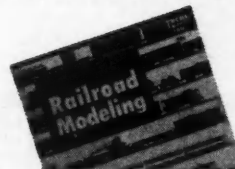
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TRENDS in New Products

NEW ONE-STEP "pushbutton" auto wax, claimed to give paste wax performance, is now being marketed by the makers of Johnson's Wax. It's called Instant J-Wax and its key feature is ease of use achieved through the 16-ounce pressurized container which dis-



penses the homogenized product as a heavy pink foam. Retail price is about \$2.50.

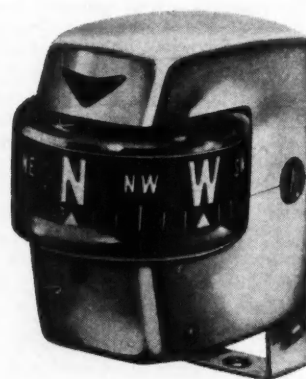
DUAL HEADLIGHT KITS for up-dating '57 Fords and Chevrolets have just recently reached the market. Each kit contains all necessary hardware, wiring with connectors attached and two pairs of dual-system bulbs. The only tool



required for the conversion is a screwdriver, and the job can be done by do-it-yourselfers in half an hour. Screws holding the original

equipment and wiring connections are first removed; then the new units are installed using the existing holes in the fenders. To complete the job, the attached wiring harness is hooked up to the terminal block and the beams are aimed with built-in adjusting screws. The system conforms to Society of Automotive Engineers standards and has been approved in all states requiring such action. List prices are \$56.50 in primed finish and \$72.75 in chrome. The units are manufactured by C. M. Hall Lamp Co., 1305 E. Hancock St., Detroit, Mich.

KNOWING WHERE YOU'RE GOING can be a lot easier on unfamiliar roads if your car is equipped with a new Celebrity Compass.



This handsome instrument is available in either a silver- or gold-plated finish. A contrasting black dial has bold white markings for maximum visibility. Indirect lighting is provided for night driving. Model 260 is gold finished and Model 265 is in silver. Both models are priced at \$6.95. The manufacturer is Dinsmore Instrument Co., 1800 Kelso, Flint, Mich.

A NEW WASHING DEVICE called Power-Wash can be a big help in keeping your car clean. It attaches to a regular garden hose and is said to have a new water pressure scrubbing action. Hollow bristles allow water to flow through in powerful sprays. The makers



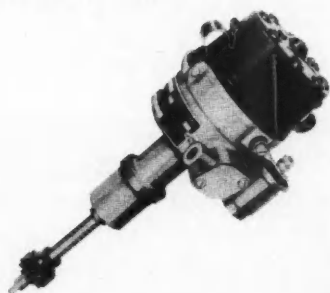
claim that the brush, made of soft plastic, will not scratch paint or remove wax from car finishes. The Power-Wash is manufactured by Mark Manufacturing Co., P.O. Box 191, Owosso, Mich. It is available in service stations, and auto accessory and hardware stores for 89¢.

CUSTOMIZING JOBS and body repairs can be made easier and more satisfactory with Shape, a new epoxy paste. It is simple to mix and apply and no special tools or equipment are necessary. The material will bond to metal, wood or Fiberglas and hardens to a tough coat which can be filed, sanded, drilled or



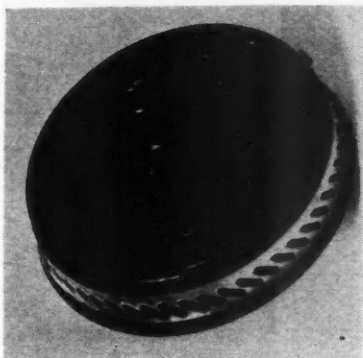
sawed. The price is \$2.98 for 3/4-pound of resin and hardener, and three-pound quantities are available for \$6.39. The manufacturer is Ren Plastics, Department E, 5422 S. Cedar St., Lansing, Mich.

IT IS RARELY that automotive products enjoy the reputation for dependability and efficiency that has been earned by Mallory ignition components. Owners of Chevrolet sixes and eights, Ford V8s, Mercurys and Oldsmobiles can now avail themselves of an excellent new



distributor at very low cost. The unit features dual points, vacuum advance, wipe-contact cap and a compensating centrifugal governor. It is manufactured by Mallory Electric Corp., 12416 Cloverdale, Detroit 4, Mich. Price is \$30 complete.

KEEPING BRAKES COOL is the first step toward eliminating dangerous brake fade. A new assist in brake drum cooling is called Kool-Fins. They consist of an aluminum band, with die-cut impeller-type cooling fins, which is



attached to the outer surface of the brake drum. Installation is made quickly by means of a special tool furnished with the fins. Wheel balance is not affected by the attachment. The price per set of four is \$9.95, and they are manufactured by Kool-Fin Industries, Garnett, Kan.



Coupe de Sport, only \$2,499 P.O.E. Western states, slightly higher.

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HANDY hints

by Rodger Darling

SPRING BRINGS A PROBLEM—Know why you may get worst vapor lock on the first warm day of spring? Extra-volatile winter-grade gasoline vaporizes in fuel line, due to engine heat *plus* weather heat, and "bubbles" block fuel flow.

What to do? Raise hood and let engine cool about 20 minutes (remove any winter radiator cover), or pour cold water over carburetor bowl, fuel pump, and gas line.

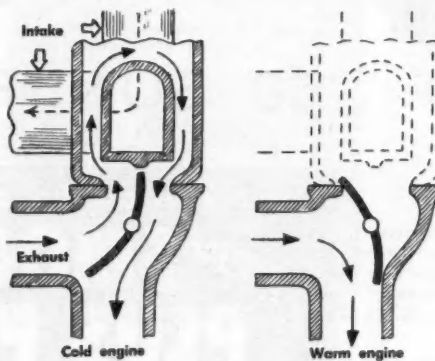
DO NOT NEGLECT—A little-known part on most cars, that can cause confusing trouble if neglected, is the "manifold heat valve." While the engine is warming up it deflects hot exhaust around the intake gallery to

This will get you going but if hot stop-and-go traffic threatens more vapor lock, drive with hood latch partly open and race engine slightly when stopped, circulating more air. You can make the rest of that tankful of winter gas less volatile by adding a can of top cylinder lube.

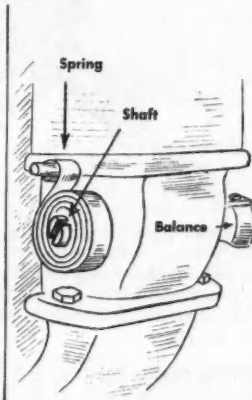
"SOMEONE'S BEEN DRIVING MY CAR"—When other members of your family drive the car, each should have the driver's seat positioned to his or her customary adjustment—or coordination may be affected, especially braking. The seat can be instantly adjusted if it has an inconspicuous line painted on its side near the floor, with another mark on the floor beside it. Line these up, and you're in exact position. Use different color marks for different drivers.

SHOT?—BB holes or "pebble pocks" in your windshield may let moisture in to discolor the plastic center of your safety glass . . . but not if you seal them promptly with a drop of airplane cement.

If it fails to close on a hot engine the incoming fuel is overheated to "leanness," so that the engine lacks power, falters at high speed, and may get vapor lock. You should be able to turn valve when engine is cold.



A TYPICAL MANIFOLD HEAT VALVE

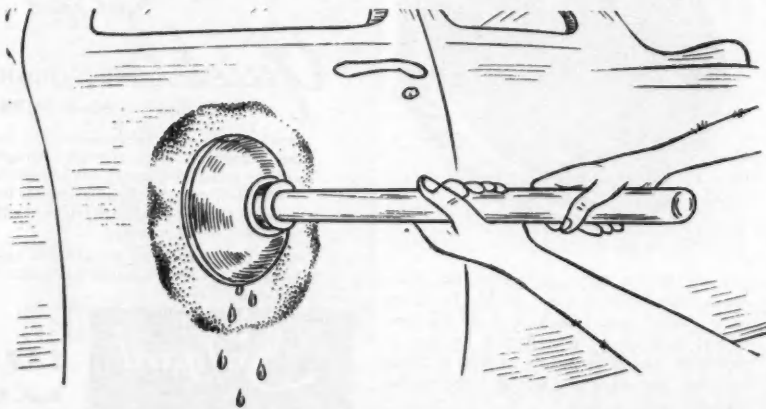


help vaporize cold wet gasoline. Controlled by a thermostat-spring, the valve diverts heat out the exhaust once the engine is warm. Carbon and corrosion often bind this valve.

Free the stuck shaft with vinegar or other suitable carbon solvent (or disassemble and scrape carbon) and keep lubricated with graphited penetrating oil.

FOR MORE PURPOSES THAN ONE—"Oil-can dents" (shallow, dish-shaped dents with the metal not creased), especially those that you

can't get behind to *push out*—such as on door panels, etc.—can often be *pulled out* with a wet plunger. Yank REAL HARD.



PRODUCT USE TEST

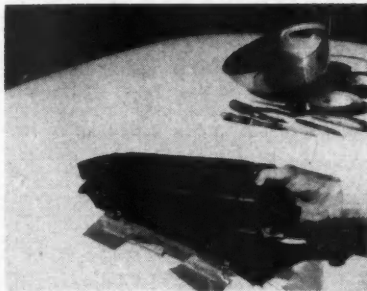
SAFETISCOPE REARVIEWER

LOOKING REARWARD has become increasingly difficult as a result of the long, low look in car styling trends. Centrally mounted, inside mirrors become practically useless when a full complement of passengers is carried. Outside mirrors also have their disadvantages in that they require a change in adjustment to suit drivers of different statures; in addition their field of view is limited.

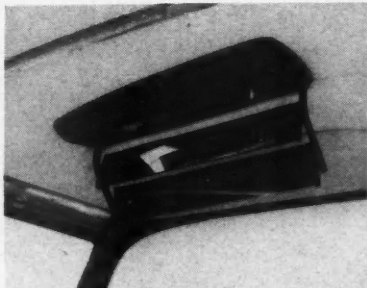
We found a novel answer to these problems when we drove a '57 Pontiac equipped with a Safetiscope Panoramic Rearviewer manufactured by National Safetiscope Corp. of Baker, Ore. This device consists of three mirrors, two of which are placed in juxtaposition to provide a periscopic rear view over the top of the car. The third mirror has a very wide field and provides a view through the rear and rear side windows.

Our first few minutes behind the wheel of the test car was a rather startling experience.

The effect was such that we were so fascinated by the rear view, we found it difficult to concentrate on the view ahead. We soon became accustomed to this, however, and settled down to the business of driving. We have come to like the way it lets us know what's going on behind our car. —Robert C. Scollay

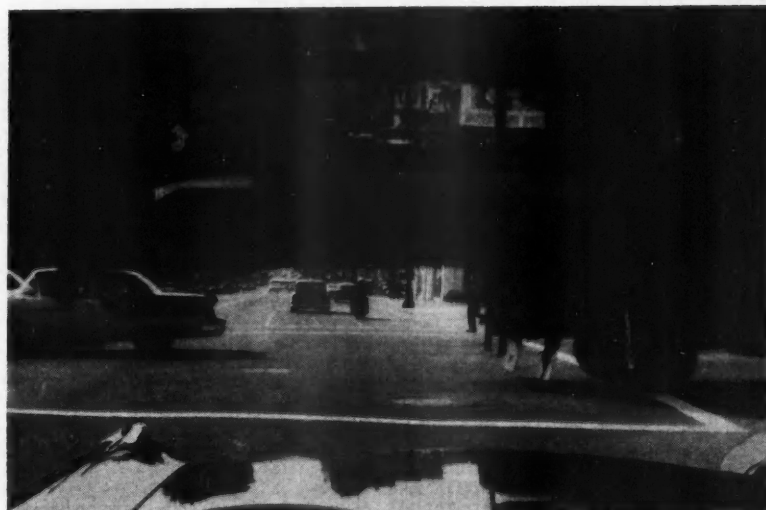
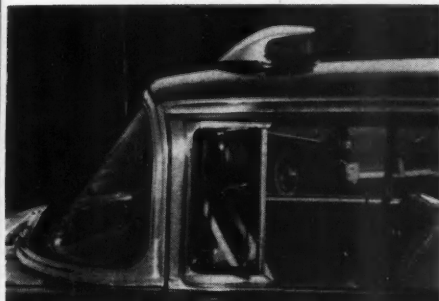


MIRRORS fit through hole in roof.



INSIDE MIRRORS have unusual location directly above driver's eyes.

PLASTIC BUBBLE houses mirrors, may be painted to match the car finish.



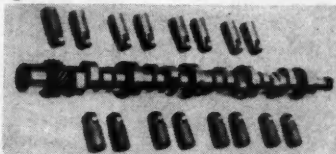
PHOTOGRAPH does only partial justice to excellent field of vision offered by Safetiscope. First effect can be startling because of image location.

EASTERN HEADQUARTERS FOR RODDERS AND TOP STOCK CAR RACERS

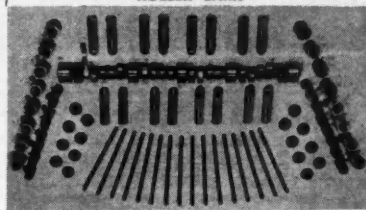


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PRODUCT USE TEST

BRAKEMASTER HYDRO-EQUALIZER

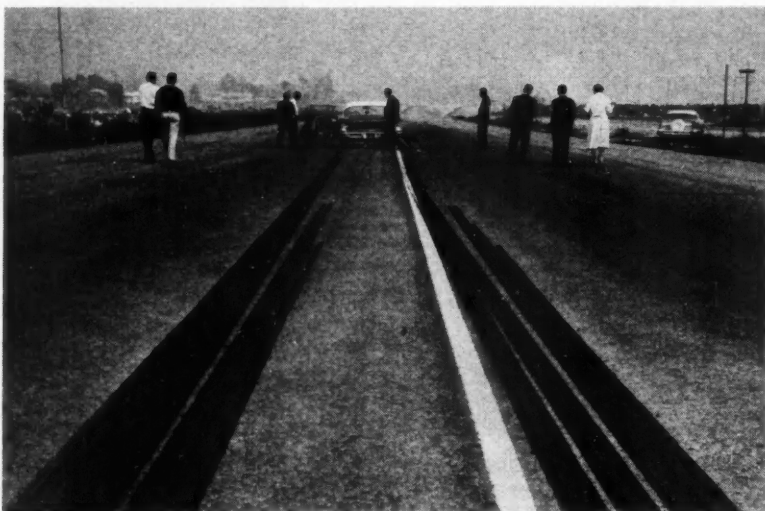
IN ONE VERY IMPORTANT FIELD of automobile engineering, Detroit has been continuously accused of giving little heed to the need for improvement—and that is in the ability to stop the car in an emergency without going into an angled skid or losing control. Automotive engineers are coping with this problem, however (see "Give Us a Brake, Detroit!" page 24), and some design improvements are gradually being made.

We had an amazing experience in testing a brand-new safe-braking device designed and developed by the inventor of the automatic pilot for aircraft, Robert E. Mitton. At the

straight line (see photo). There was absolutely no angle of deviation from the car's line of original travel to the stopped position. In addition, stopping distances at the various speeds were chopped by a number of feet in every case, as follows:

STOPPING DISTANCES

MPH	Without Unit	With Unit
40	53 ft.	51 ft.
50	98 ft.	92 ft.
60	144 ft.	122 ft.
70	167 ft.	156 ft.



EXCELLENT STOPPING CONTROLLABILITY is indicated by straight-line tire marks made when '58 Pontiac was panic-stopped at 40 to 80 mph. Without device, car went into a skid, stopping at right angles to travel direction.

San Fernando, Calif. dragstrip, we panic-stopped a 1958 Pontiac Star Chief two-door hardtop, *without* and *with* this new device installed, at various speeds beginning at 40 mph and finally reaching a top of 70 mph.

In the stops *without* the unit installed, the Pontiac behaved fairly well in stops made from the comparatively slow speed of 40 mph. At higher speeds, the angle of deviation from line of travel to the stopped position of the vehicle became increasingly worse as 50-, 60-, and finally 70-mph stops were made.

Without giving the brakes a chance to cool after making a series of seven panic stops, the device—called the Brakemaster Hydro-Equalizer—was installed in the hydraulic line at the system's master cylinder. This job took about three minutes, and we were off again in a second series of panic stops. In every single stop made—and this is the astounding factor—the Pontiac came to a halt in an *exact*

HOW DOES IT WORK? In a conventional hydraulic brake system, when the pedal is depressed, equal pressure is applied to all brake shoes. While this is true in theory, the actual pressure between shoes and drums on all four wheels, because of dimensional factors, may not be constant at all times. There is a concentricity relationship between shoes and drums which, in the most simple terms, might be described as an "out-of-round" condition. As the drum rotates, the contact pressure between drum and shoe will vary as the shoe is pushed against the high and low spots on the drum.

Brake fluid cannot be compressed, and therefore under pressure it acts almost like a solid rod or piece of steel in the brake lines of an automobile. As long as the brake pedal is held down, the hydraulic fluid in the lines and cylinders does not change in volume. The pressure on the fluid, however, rises and

falls in proportion to the extent the brake drum is out of round. When the shoe contacts a high spot, it squeezes tighter against the drum, with a corresponding increase in drum friction, causing possible lock-up of this particular wheel. With one or more wheels still turning, there is an unequal transmission of braking effort from wheels to roadway which usually results in an uncontrollable skid.

But, with the Brakemaster Hydro-Equalizer installed, this danger is virtually eliminated, as the fluid pressure is automatically balanced by the action of the relief valve. The friction pressure of the brake shoes against the drum remains constant, regardless of the out-of-round condition of the brake drums in any one or all of the wheels. In actuality, the unit allows the brake fluid pressure in the lines to fluctuate as necessary, permitting any high spots in the brake drums to pass around while maintaining the extreme pressure (as in a panic stop) on the brake drums. This constant hydraulic pressure and uniform coefficient of drum friction in each wheel during the cycle of rotation results in an even, completely controlled stopping of the car.

Uncontrollability of a car when stopping at high speeds is a dangerous shortcoming. Our tests would seem to prove that the Brakemaster Hydro-Equalizer eliminates this hazard, for when we removed the unit from the Pontiac after the above tests, we decided to make just one more panic stop at 70 mph without the unit on the car. Result: The car went into a hair-raising skid that became absolutely uncontrollable, with the vehicle finally coming to a halt at right angles to the direction of travel! Needless to say, we were convinced of the merits of this new high-speed-braking safety device for automobiles.

The Brakemaster Hydro-Equalizer is a device that can be considered a step in the right direction. Now if someone will only come up with drums and shoes that will eliminate that chronic bugaboo of American brakes—bad fading characteristics—then we'll be well on the road to safer driving and surer stopping!

The Brakemaster Hydro-Equalizer is available at \$14.95 from Accessories International, 1925 Blake Ave., Los Angeles 39, Calif.

—James E. Potter

PHOTOS BY BOB D'OLIVO



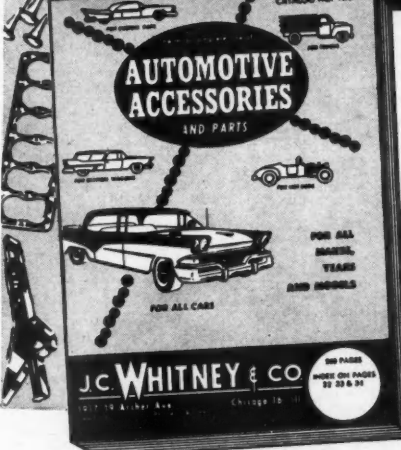
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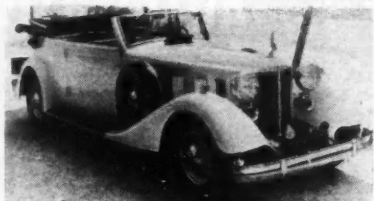
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classic, imported & restored in 1955. See Nov. '56 MOTOR TREND, page 42. \$1600. H. W. Kranz, 498 Edinborough Dr., Bay Village, Ohio.

'47 LINCOLN CONTINENTAL conv. in mint cond. Father & son orig. & 2nd owners. Ohv Lincoln 8-cyl. engine. New top, new gray lacquer, reupholstered. J. H. Taylor, 524 Federal St., Pittsburgh 12, Pa. Phone Hilltop 3-1910.

FORD T PARTS—widest range of parts available at lowest prices. Free listing. Also Model A mechanical parts listing free. E. Hemmings, Quincy, Ill. CLASSIC & ANTIQUE CAR CATALOGS: Packard, Chrysler, Lincoln, Cadillac, Pierce-Arrow, Buick, Orphan & Foreign cars; minimum \$5 each. Also MOTOR (N.Y.) Annual numbers. Details for large, stamped addressed envelope. A. E. Twohy, 400 N. Kenmore, Los Angeles.

'36 CORD Westchester sed. Body, fenders, lights, paint A-1 shape. Factory-rebuilt engine & trans.; new Universals. T. H. Broecker, P.O. Box 1108, Louisville, Ky.

DUCE PICKUP. Completely stock—front fender mount, 4-puncher engine. Excellent for custom job. Come & get it for \$175. J. H. Lamoreux, Cherokee, Iowa.

'42 PACKARD 160 Super 8 Series 2023 conv. cpe. Running boards & sidemounts. Nice cond. \$675. Robert Davison, 21555 W. McNichols Rd., Detroit 19, Mich.

MOTOR (N.Y.) Annual Show Numbers 1925 thru '43. Orig. magazine ads & color prints of Duesenberg, Cord, Auburn, Cadillac, Packard, Lincoln, Marmon, Stutz, Pierce-Arrow, etc. Complete listings 25¢. Sheldon J. Lewis, 61-33 213th St., Bayside, L.I., N.Y.

'20 STUTZ Bulldog. New tires, top, boot & paint. Mechanically perf. \$3500. Description & pix on request. F. W. Frew, Box 188, Decatur, Ga.

'46 LINCOLN CONTINENTAL conv., with '48 Cadillac engine, r & h. Approx. mileage 50,000; good cond. \$1500 or offer. Garaged in Baltimore, Md. Contact owner's representative, F. Chessman, Room 900, 405 Montgomery St., San Francisco, Calif. Phone Ulster 1-0700.

'48 LINCOLN CONTINENTAL V-12 conv. in good running cond. New top & uph. Windows & top operation need minor repairs. \$500. J. J. Giles, 3323 Winterbourne Rd., Baltimore 16, Md.

'41 CADILLAC conv. Needs rings, brake job, some body work, new top & paint. \$500 as is, or \$400 with rings, tune-up & brake job. Or best offer. Robert M. Howard, P.O. Box 23, La Belle, Mo.

'34 BUICK 4-dr., with 6 wheels. Beautifully restored



—19 coats of black lacquer, complete engine o'haul. Any reasonable offer accepted. Jack Palmer, 296 Willis Rd., Connellsville, Pa.

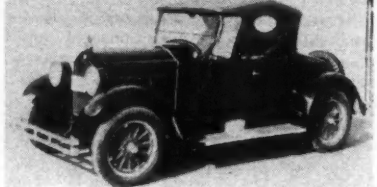
'36 CORD 810 Westchester sed. in good cond. Factory-rebuilt engine. \$1000. Dr. M. O. Klingler, 213 W. LaPorte St., Plymouth, Ind.

'49 BUICK Roadmaster Riviera htdp. in good cond. Emma Kauppedas, 2505 Gordon Dr., Sioux City 6, Iowa.

'29 MODEL A cpe. Chassis completely restored with most parts new. Body needs paint & uph. Many

extra parts. \$200. E. Romney, 58 Prospect St., Milford, N. H.

'24 BUICK 4-cyl. rdstr. Completely restored—engine o'hailed, new uph., top & side curtains. Black



lacquer. Best offer over \$950. Joseph F. Komar, 5819 W. National, West Allis 14, Wis.

'48 LINCOLN CONTINENTAL cabriolet, with new '55 Mercury engine & transmission. Black, with new red orlon top, new nylon frieze uph. Extra parts, including V-12 engine. \$3600. Marion D. Spurgeon, 2813 Idaho Ave. So., Minneapolis 26, Minn. Phone WE 9-9596.

'37 LINCOLN V-12 Model K LeBaron conv. rdstr. Rough, but in restorable cond. This is a large 6000-lb. true classic, \$300 or best offer. Walter C. Shomo, 18 Roving Rd., Levittown, Pa. Phone WI 5-8449.

'37 CORD supercharged phaeton. Sound condition, just rebored. \$1000 or best offer. John Vogeler, Eastwoods Rd., Pound Ridge, N.Y.

'48 LINCOLN CONTINENTAL htdp. with Cadillac engine. Platinum gray finish, custom interior, Vogue ww's. One of the newest Continentals in the country, in almost-showroom cond. \$2000. C. D. Kerswill, 647 S. 22nd St., Louisville, Ky. Phones SP 8-8531 or TW 5-8794.

'28 ROLLS-ROYCE with Nordberg body. Also '38 Rolls-Royce Phantom I in exc. cond.; black. \$2500 c.i.f. New York or Philadelphia. Ulf Bussler, Swedenborgsgatan 2, Stockholm 30, Sweden.

'51 FORDILLAC customized cpe. Borrani wire wheels, maroon & gray leather. 4-in. bore. Chet



Herbert roller cam, Scintilla magneto, reworked heads. Highest bid above \$1200. Charles Kingsbridge 8-4484.

'41 LINCOLN CONTINENTAL htdp. Dark blue lacquer, with 5 good ww's. Newly rebuilt: V-12 engine, clutch, radiator, differential, brakes & ignition. Exc. cond. \$1295. H. B. Everett, Jr., 4802 Camp Bowie, Fort Worth, Tex.

'39 CADILLAC V-16 7-pass. enclosed limousine. Like-new cond., less than \$5,000 actual mi. Fender wells, heater, \$1500 spent on car in last 10 yrs. \$995. Max Palm III, Box 546, Cincinnati 43, Ohio. Phone Terrace 1-4278.

'15 OVERLAND Model 80 Speedster. Newly restored—has orig. custom body, white hand-buffed lacquer finish stripped in black, black leather, white wire wheels. \$1695. Max Palm III, Box 546, Cincinnati 43, Ohio. Phone Terrace 1-4278.

'28 PACKARD 6 touring in exc. running cond.; new clutch. Orig. leather good; needs paint & top recovered. 7 tires included. Drive it home. \$795. Max Palm III, Box 546, Cincinnati 43, Ohio. Phone Terrace 1-4278.

'48 LINCOLN CONTINENTAL htdp. Orig. thru-out; black, with ww's. Exc. cond.; 39,000 mi. All extras, including o.d. \$1500 or best offer—must sell. J. N. Dockery, 3333 Erie St., Racine, Wis. Phone ME10se 7-1563.

BUGATTI—just imported from France with Molsheim factory-reconditioned engine. Best cash offer. W. Gulson, 8417 Sunset Blvd., Hollywood, Calif. Phone OL 4-3092.

'39 PACKARD V-12 7-pass. touring sed. Orig. paint, immac. uph., new clutch & brakes, leather front seat covers. Exc. mechanically. \$1500. Norm Newcomb, 1024 Prospect, Pasadena, Calif. Phone SYcamore 5-1289.

'29 MODEL A. Completely restored, orig. factory uph.; new condition. \$1300. Chic Vandagriff, 605 S. Arroyo Parkway, Pasadena, Calif.

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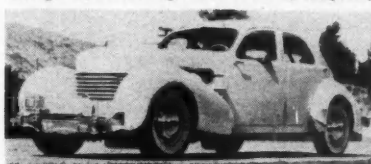
CADILLAC PARTS—2 rear springs, 2 front coil springs, 2 front & rear shocks, front & rear inner & outer wheel bearings & Universal joints. All in exc. cond. Fits all Cadillacs 1941 thru '48. \$50 for everything; shipped postpaid & insured. A. Ward Shanen, 2444 S. Orkney St., Philadelphia 48, Pa.

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2 BRAND-NEW TIRE MIRRORS. Fit all classic cars. \$35 pr., shipped postpaid & insured. A. Ward Shanen, 2444 S. Orkney St., Philadelphia 48, Pa.

'37 CORD Westchester. Concours winner—orig. painted maroon uph. like new, white lacquer, rechromed. Good running cond.—rewired, completely



reconditioned. Illness demands quick sale. \$1500. B. W. Reese, 20581 Concord Ave., Hayward, Calif.

COMPLETE LINE of access. for '49 Ford reuston V8 2-dr., including Header exhaust system with 2 steel packed mufflers. For complete info write Richard Bauge, 119 E. 12th St., Ames, Iowa.

CORD L-29 ENGINE & transmission—complete except generator. Rebuilt several years ago—never run. \$150. C. McCord Purdy, 336 N. Graham Ave., Indianapolis, Ind.

'33 CHEVROLET rdstr., with rumbleseat, free wheeling. 75% restored; engine completely overhauled, new uph. & top. Body & chrome good. \$300. Carl Stein, 1 Seneca Trail, Packanack Lake, N. J. Phone MOUNTAINVIEW 8-4748.

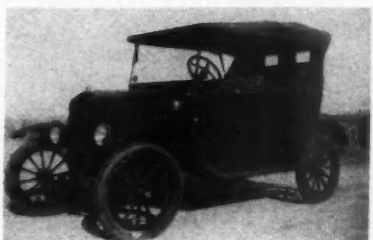
'53 CHRYSLER ENGINE—331 cu. in. Herbert 282 cam. Roller tappets, Edmunds dual manifold, Stromberg carburetors, other extras. Details on request. 200-mi. free delivery. \$300 or best offer. George Langford, 320 Hampton Pl., Hinsdale, Ill. Phone FA 3-2311.

'47 LINCOLN CONTINENTAL htdp., with rebuilt Cadillac engine & standard transmission. A-1 body, uph. Black & red, with ww's. Owned since '51; in storage. \$1000. Ken Blakeman, R.F.D. No. 1, Phoenix, N.Y.

'23 REO touring. Mint cond.; 11,000 orig. mi. Dark blue hand-rubbed finish, gray leather uph., exc. top, new side curtains. Operator's instruction manual. \$1500. Harry B. Ellis, 189 Capt. Pierce Rd., Egypt, Mass. Phone SCITUATE 1445.

WRECKING '36 CADILLAC V-16 conv. sed. Make offer for your needs. A. E. Marcotte, Box 662, Glenview, Mont.

'24 MODEL T touring. Exc. running cond.; good tires. Top, uph., paint, side curtains & floor mats



in fair cond. Old Moulton Community. \$1000. Henry Lehman, Route 3, Shiner, Tex.

'40 PACKARD-DARRIN conv. victoria—one of the orig. '37 Darrins. Authentic exterior immac. Chrysler V8 engine installed; orig. engine available. Best offer over \$3000. Duke Davenport, 1636 48th St., San Diego 2, Calif.

CUSTOM—126 in. long, 54 in. wide, & 30 in. high at the cowl. Blue-green lacquer; white Naugahyde uph. Rear-mounted Crosley engine, transmission & differential. R & H. Will travel about 60 mph at 30 mpg. Make offer. Joe Noel, 1920 S. Main St., Kokomo, Ind.

'25 OVERLAND coach. Orig. cond. & paint. Good running order; fair tires. One owner; always garaged. Best offer. Raymond Chabot, Ponteix, Sask., Canada.

'51 RILEY 2.5-liter sed. 100-hp engine, 4-speed gearbox, torsion bar suspension. Near-mint cond. All orig., except new top. \$1375. Irv Gimble, 2852 Ladera Rd., San Bernardino, Calif.

'19 MODEL T rdstr. Completely reconditioned; new uph. Engine in fair cond. \$500. Bill Burrows, Rt. 2, Box 2198, Red Bluff, Calif. Phone 11-R-3.

FORDILLAC Ranch Wagon. Perfect '54 engine. McCulloch supercharger, knockoff wire wheels. Cad manual box. Utility with terrific performance. Best offer over \$1800. Dale Burt Automotive, 2506 Bartlett St., Houston, Tex.

'31 AUBURN 8 Model 818-A sed. Also '33 Plymouth deluxe cpe. Both cars in fine mech. cond., with good tires. \$150 each. Philip V. Campiglia, 51-17 Junction Blvd., Elmhurst 73, L.I., N.Y.

'35 REO FLYING CLOUD 4-dr. bustle-back. Self-shifter transmission, body & running gear very good; exc. tires. Easy restoration. Orig. owner too old to drive. \$225. Arthur Taft, 531 Bernard St., Linden, N.J.

'52 HILLMAN conv. Factory-rebuilt V-8 60 90% installed. Clutch linkage, radiator connections & interior incomplete. 4 new ww's. Details on request; all offers considered. Henry Perry, 112 Barnes Mill Rd., Richmond, Ky.

'14 AMERICAN-LA FRANCE fire engine. Tires, 6-cyl. engine & body in very good cond. Orig. thruout; excellent for complete restoration. In storage. Highest bid. Merritt Linn, 3-225 S.W. 9th St., Portland, Ore.

'41 CADILLAC Fleetwood. Exc. mech. cond.; standard transmission. Exterior & interior immac. R & h. Owned & driven by 1 family. Best offer over \$550. F. M. Curlee, 409 W. "C" St., Dixon, Calif.

'47 LINCOLN CONTINENTAL htdp. Orig., black with ww's; r & h, o.d. Very good cond. Priced for quick sale—\$795. Nick Bieda, 701 1st St. & Harrison St., Hoboken, N.J. Phone OL 6-6496.

'41 PACKARD 160 4-dr. sed. Orig. green finish; 57,000 actual mi. Engine, body & uph. in fine cond. \$275. C. R. Deyoe, 807 S. Maple, Fairfield, Iowa.

'37 MERCEDES-BENZ 4-dr. conv.—one of 5 built specially for high Nazi Party officials, believed to have belonged to Rudolph Hess. Good rubber, new top & battery. Leather uph., built-in lube system. Good running cond.; licensed last yr. Mrs. Kaare Dahl, 958 E. Johns St., Tacoma 44, Wash.

'35 FORD phaeton, completely restored in '54. 99T engine, tubular shocks, new '36 steering box. Orig. outward appearance, bumpers rechromed, etc. \$400. R. B. Asbury, 1565 W. Barstow, Fresno, Calif.

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HANOVIA ALPINE SUN LAMP. Professional Model S-319A. Like new; complete with instruction data & goggles, etc. Cost \$169.50; will trade for antique & classic car literature in mint cond. worth same amount, or sell outright for \$95, shipped prepaid & insured. A. Ward Shanen, 2444 S. Orkney St., Philadelphia 48, Pa.

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'29 MODEL A tudor sed. Exc. orig. cond., 4 new tires, 24,000 mi. Make offer, or will swap. John W. Young, Box 85, Brookfield, Conn.

'48 LINCOLN CONTINENTAL htdp. Like-new cond.—new paint, new ww's & uph. Full-race Mercury engine. Sell for \$3000, or trade up or down for Rolls-Royce. A. A. Hamilton, 104 1st Ave. W., Hennepin, Minn.

'48 LINCOLN CONTINENTAL V-12 conv. Black, with ww's; o.d., r & h. New top, body & interior in exc. cond.; engine overhauled. \$1695, or will trade for late-model car. P. A. Relyea, Box 267, Middlebury, Vt.

SPECIAL VINCENT MOTORCYCLE. 4 yrs. spent redesigning & rebuilding. \$1000 or suitable trade. Also for sale: '47 French Peugeot car. Wanted by Peugeot parts. Vaughn M. Greene, Eng. Dept., USNS General E. D. Patrick (T-AP 124) c/o Fleet Post Office, San Francisco, Calif.

WANTED

TEMPLAR CAR—rdstr. preferred. Restored, or in top-notch restorable cond. Send pix if available & price in 1st letter. Raymond Hagadorn, 397 Ballston Rd., Scotia 2, N.Y.

NEW TUCKER ENGINE—complete. J. Woytowich, 78 Rutgers St., Belleville, N. J.

'32, '33 or '34 FORD phaeton (2nd choice—rdstr.). Mechanical cond. unimportant, but body must be suitable for restoration. Charles M. Bohman, 8930 Trinkle Rd., Route 1, Dexter, Mich.

CASH for pre-war auto catalogs, show annuals, radiator emblems—any make. Highest prices for Rolls-Royce, Gardner, Peerless, Packard, Mercedes-Benz, Moon, Buick, all big-car literature. Lewis A. Mayer, Munith, Mich.

COMPLETE DYNAMOMETER or power absorption unit to handle 200-300 hp. Must be reasonable. Taylor or Clayton preferred. Jim Townsend, 2545 Proctor St., Port Arthur, Tex.

HIGHEST CASH PRICES PAID for MoToR (N.Y.). Annual Show numbers (any cond.) 1918 thru '40. Monthlies 1920 thru '30. Orig. catalogs, folders & brochures of classics. Sheldon J. Lewis, 61-33 213th St., Bayside, L.I., N.Y.

'39 LINCOLN ZEPHYR cpe. with good body. Will pick up anywhere & handle with loving care. Also need loads of parts for Lincoln Zephyr Club. Bob Olmsted, 1648 Mar St., Dearborn, Mich.

SERVICE MANUAL for '55 Lincoln Model BV-60A. Ed Murphy, 134 Clark St., Hartford, Conn.

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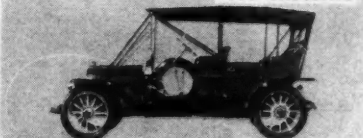
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RHUMBA: A dance where the front of you goes along nice and smooth like a Cadillac, and the back of you makes like a Jeep.

OPTIMIST: An auto assembly line worker who brings his lunch.

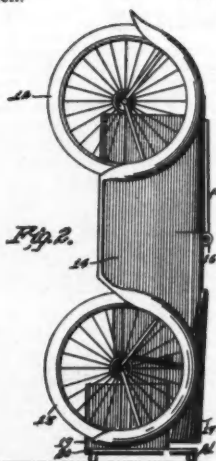
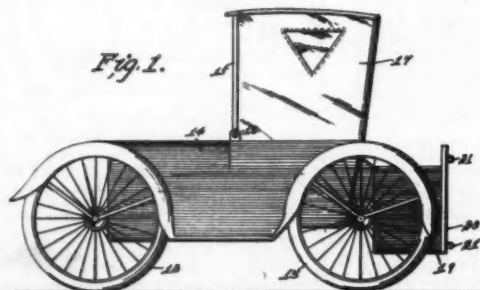


NIGHTMARE THAT CAME TRUE—Yes, it finally happened—in Tokyo. It started with a daring turn against traffic, and soon all was horn-honking chaos. But oriental patience is a virtue to be reckoned with—and in half an hour the jam was cleared. Question: who backed up?



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